American Museum Novitates

PUBLISHED BY THE AMERICAN MUSEUM OF NATURAL HISTORY
CENTRAL PARK WEST AT 79TH STREET, NEW YORK, N. Y. 10024

NUMBER 2287 APRIL 13, 1967

# A Check List of the New World Venomous Coral Snakes (Elapidae), with Descriptions of New Forms

By Jánis A. Roze[1]

## INTRODUCTION

This check list summarizes preliminary revisionary studies of the New World elapid genera *Leptomicrurus, Micruroides*, and *Micrurus*, the reptiles categorically known as coral snakes. The three genera contain 111 forms, including several described herein, which I have tentatively assigned to 50 species. A more extensive and detailed account of the systematics and zoogeography of the coral snakes, their venom, and the incidence of snake bite is being prepared. Meanwhile, the publication of this preliminary check list will provide herpetologists with a summary of the systematics of the group.

Studies sponsored by the American Museum of Natural History were supported by the Public Health Service of the United States Department of Health, Education, and Welfare (PHS Grant No. 00136). My earlier studies of coral snakes were sponsored by the Field Museum of Natural History and the Fundación Creole in Caracas, Venezuela. I am greatly indebted to the authorities of these institutions, and I assure all of them that their aid is deeply appreciated.

During my studies, I have examined the coral snakes in the collections of nearly all the large museums and universities in the United States,

[1] Research Associate, Department of Herpetology, the American Museum of Natural History; Profesor de Zoología, Universidad Central de Venezuela, Caracas.

Europe, and Latin America. A complete list of the herpetologists and others who so generously helped to carry out the research will appear in a forthcoming publication. The following is a list of collections, the abbreviations used here, and persons in charge of the collections that contain type material of the new forms described in the present check list:

A.M.N.H., the American Museum of Natural History (Dr. C. M. Bogert, Dr. R. G. Zweifel)
B.M., British Museum (Natural History), London (Dr. A. G. C. Grandison)
C.A.S., the California Academy of Sciences (Dr. A. Leviton)
C.M., Carnegie Museum (Mr. N. D. Richmond)
C.N.H.M., Chicago Natural History Museum (presently Field Museum of Natural History; Dr. R. F. Inger, Mr. H. Marx)
E.A.L., Ernest A. Liner herpetological collection, Hammond, Louisiana (Mr. E. A. Liner)
F.A.S., Frederick A. Shannon collection (the late Dr. F. A. Shannon)
I.B., Instituto Butantan, São Paulo, Brazil (Dr. A. Hoge)
I.L.S., Instituto La Salle, Bogotá, Colombia (Rvdo. Hno. Nicéforo María)
J.F.C., herpetological collection of Joseph F. Copp (Mr. J. F. Copp)
K.U., Museum of Natural History, University of Kansas (Dr. W. E. Duellman)
M.C.Z., Museum of Comparative Zoology, Harvard University (Dr. E. E. Williams)
M.H.N.P., Muséum National d'Histoire Naturelle, Paris (Dr. J. Guibé)
M.N.R., Museu Nacional, Rio de Janeiro, Brazil (Dr. A. Leitão de Carvalho, Dr. B. Lutz)
M.V.Z., Museum of Vertebrate Zoology, University of California (Dr. R. C. Stebbins)
N.M.W., Naturhistorisches Museum, Vienna, Austria (Dr. J. Eiselt)
S.M.F., Senckenbergische Naturforschende Gesellschaft, Frankfurt-am-Main, Germany (Dr. K. Klemmer)
U.I., University of Illinois Museum of Natural History (Dr. H. M. Smith)
U.M.M.Z., University of Michigan Museum of Zoology (Dr. C. F. Walker)
U.S.N.M., United States National Museum, Smithsonian Institution (Dr. D. M. Cochran, Dr. J. A. Peters)
Z.M.B., Zoologisches Museum, Hamburg, Germany (Dr. W. Ladiges)

All the new species and subspecies described in the present publication have the number and distribution of the cephalic scales and other characteristics typical of the genera *Micrurus* or *Micruroides*. They have one rostral, two internasals, two prefrontals, one frontal, two parietals, one nasal that is divided, no loreal, one preocular, two postoculars, seven supralabials, the third and fourth of which are in contact with the eye, seven infralabials, and two pairs of chin shields. There are 15-15 rows of dorsals, the anal plate is divided, and the subcaudals are all divided, unless otherwise stated.

Only the original description and the most important records are men-

tioned in the synonymy—particular individual revisions or recent faunal check lists covering a country. If no synonyms equal to the name used in the present publication are mentioned, it means that a new combination is proposed here, and usually a brief explanation for such action is given; otherwise it will be explained in the forthcoming publication.

The localities are given in the original Spanish or Portuguese spelling, except the names of countries, for which the English name is used.

## GENUS *LEPTOMICRURUS* SCHMIDT, 1937

### *Leptomicrurus collaris* (Schlegel)

*Elaps collaris* SCHLEGEL, 1837, p. 448. Type locality: Not given.
*Elaps gastrodelus* DUMÉRIL, BIBRON, AND DUMÉRIL, 1854, p. 1212. Type locality: Unknown.
*Leptomicrurus collaris:* SCHMIDT, 1937, p. 363.

DISTRIBUTION: Southeastern Venezuela and Guyana (formerly British Guiana).

### *Leptomicrurus narduccii* (Jan)

*Elaps narduccii* JAN, 1863b, p. 222. Type locality: Bolivia.
*Elaps scutiventris* COPE, 1869, p. 156. Type locality: Pebas on the Amazon, Ecuador.
*Elaps melanotus* W. PETERS, 1881, p. 51. Type locality: Sarayacú, Ecuador.
*Leptomicrurus narduccii:* SCHMIDT, 1937, p. 363. J. A. PETERS, 1960, p. 525.

DISTRIBUTION: Amazonian slopes of the Andes in southern Colombia, Ecuador, Peru, and Bolivia.

### *Leptomicrurus schmidti* Hoge and Romano

*Leptomicrurus schmidti* HOGE AND ROMANO, 1966, p. 1, figs. 2a–c. Type locality: Tapurucuara, district of Uaupés, state of Amazonas, Brazil.

DISTRIBUTION: Known only from the type locality.

## GENUS *MICRUROIDES* SCHMIDT, 1928

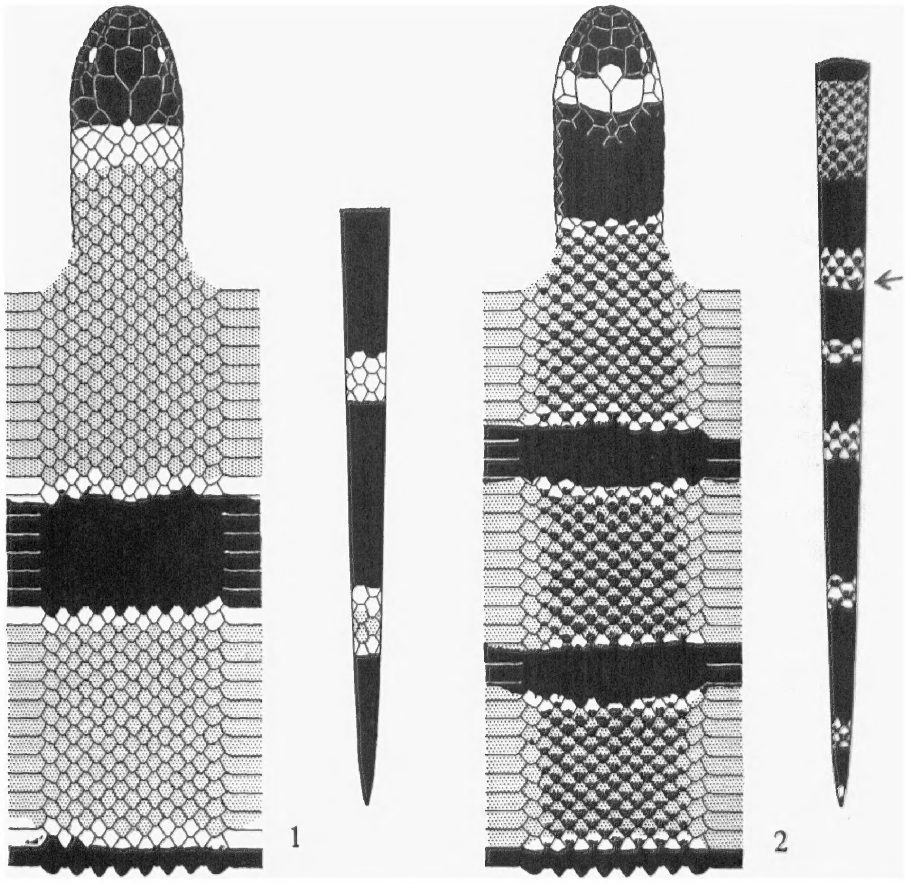
### *Micruroides euryxanthus euryxanthus* (Kennicott)

*Elaps euryxanthus* KENNICOTT, 1860, p. 337. Type locality: Sonora, Mexico.
*Micruroides euryxanthus euryxanthus:* ZWEIFEL AND NORRIS, 1955, p. 246.

DISTRIBUTION: Southern Arizona and southwestern New Mexico to northern Chihuahua and Sonora, Mexico.

### *Micruroides euryxanthus australis* Zweifel and Norris

*Micuruoides euryxanthus australis* ZWEIFEL AND NORRIS, 1955, p. 246. Type locality: Guirocoba, Sonora, Mexico.




FIGS. 1, 2. Color pattern of *Micruroides* and *Micrurus*. 1. *Micruroides euryxanthus neglectus,* new subspecies (U.M.M.Z. No. 114637). 2. *Micrurus annellatus bolivianus,* new subspecies (Z.M.H. No. 2706e). In life stippled areas are red; white areas, white or yellow; and black areas, black. Arrow indicates the position of the anal plate.

DISTRIBUTION: Southern Sonora and probably Chihuahua, Mexico.

NOTES: This subspecies intergrades with *M. e. euryxanthus* in central Sonora.

### Micruroides euryxanthus neglectus, new subspecies

Figure 1

*Micruroides euryxanthus australis:* (*nec* Zweifel and Norris) DUELLMAN, 1957, p. 240.

HOLOTYPE: U.M.M.Z. No. 114637, a male, collected by W. E. Duellman.

TYPE LOCALITY: Sixteen and three-tenths miles north-northwest of Mazatlán, Sinaloa, Mexico.

PARATYPE: J.F.C. No. 62-56, a male, from 20 miles north of Mazatlán, Sinaloa, Mexico.

DIAGNOSIS: Related to *M. euryxanthus australis,* from which it differs in having fewer ventrals in males (206 to 207 as against 213 to 226), and in having yellow bands one-half to two scales long, rather than two and a half to four scales long as in *M. e. australis.*

DESCRIPTION OF HOLOTYPE: The rostral is wider than high; the internasals are a little shorter than the prefrontals. The frontal is narrower than the supraocular and is as long as its distance from the posterior border of the rostral. The parietals are a little longer than the frontal. There are 1+2 temporals. The specimen has 206 ventrals and 25 subcaudals, or a total of 231.

The head is all black, including the parietals, posttemporals, supralabials, infralabials, and chin shields. There are light spots on the last infralabials. There are 13 black bands on the body and two on the tail. The black body bands are five to seven dorsals and five to six ventrals long and are bordered by yellow bands one-half to one scale long. The yellow nuchal band is two dorsals long. The red bands are immaculate, but the dorsal scales included in the red bands have a slightly brownish border. The red bands encompass a total of 106 rows of dorsal scales.

The specimen measures 430 mm. in total length, with 39 mm. of that being tail length. The ratio of tail length to total length is 0.091.

DESCRIPTION OF PARATYPE: The paratype is similar to the holotype, except that the posterior tips of the parietal scales are light, and the yellow bands on the body are two scales long. There are 12 black bands on the body and two on the tail. This specimen also has a total of 106 rows of red scales on the dorsum. It has 207 ventrals and 26 subcaudals.

NOTES: This subspecies is comprised of the southernmost representatives of the genus *Micruroides.*

## GENUS *MICRURUS* WAGLER, 1824

### *Micrurus albicinctus* Amaral

*Micrurus albicinctus* AMARAL, 1926b, p. 26, figs. 7–10. Type locality: Northern and central Mato Grosso, Brazil.

*Micrurus waehnerorum* MEISE, 1938, p. 20. Type locality: São Paulo de Olivença, Brazil.

DISTRIBUTION: From Mato Grosso to the region of São Paulo de Olivença, Brazil.

### *Micrurus alleni alleni* Schmidt

*Micrurus nigrocinctus alleni* SCHMIDT, 1936b, p. 209. fig. 25. Type locality: Río Mico, 7 miles above Rama, Siquía District, Nicaragua.

*Micrurus alleni richardi* TAYLOR, 1951, p. 169, pl. 23. Type locality: Los Diamantes, 2 kilometers southeast of Guápiles, Costa Rica.

DISTRIBUTION: Atlantic side of Nicaragua, Costa Rica to northwestern Panama.

NOTES: Taylor (1951) correctly stated that *M. alleni* does not belong to the *M. nigrocinctus* complex. The distributions of the two species overlap.

### *Micrurus alleni yatesi* Dunn

*Micrurus nigrocinctus yatesi* DUNN, 1942, p. 8. Type locality: Farm Two, Chiriquí Land Co., near Puerto Armuelles, Chiriquí, Panama.

DISTRIBUTION: Pacific side of southeastern Costa Rica and southwestern Panama.

### *Micrurus ancoralis ancoralis* (Jan)

*Elaps marcgravii* var. *ancoralis* JAN, 1872, pl. 4, fig. 2. Type locality: Ecuador.
*Elaps rosenbergi* BOULENGER, 1898b, p. 117, pl. 13. Type locality: Paramba, Ecuador.
*Micrurus ancoralis ancoralis:* SCHMIDT, 1936a, p. 197. J. A. PETERS, 1960, p. 530.

DISTRIBUTION: Pacific side of Ecuador.

### *Micrurus ancoralis jani* Schmidt

*Micrurus ancoralis jani* SCHMIDT, 1936a, p. 197. Type locality: Andagoya, Chocó, Colombia. SCHMIDT, 1955, p. 351.

DISTRIBUTION: Eastern Panama to the Chocó region of western Colombia.

### *Micrurus annellatus annellatus* (W. Peters)

*Elaps annellatus* W. PETERS, 1871, p. 402. Type locality: Pozuzo, Peru.
*Micrurus annellatus annellatus:* SCHMIDT, 1954, p. 322.

DISTRIBUTION: Moderate elevations of the Amazonian slopes of the Andes, from southern Ecuador to central Peru.

### *Micrurus annellatus balzani* (Boulenger)

*Elaps balzani* BOULENGER, 1898a, p. 130. Type locality: Yungas, Bolivia.
*Elaps regularis* BOULENGER, 1902c, p. 402. Type locality: Chulumani, Bolivia.
*Micrurus balzani:* SCHMIDT, 1936a, p. 192.

DISTRIBUTION: Amazonian slopes of the Andes in western Bolivia.

NOTES: Apparently this form is closely related to *M. a. annellatus.*

**Micrurus annellatus bolivianus,** new subspecies

Figure 2

HOLOTYPE: Z.M.H. No. 2706e, a female, obtained by "Rolle" on May 29, 1897.

TYPE LOCALITY: Charobamba River, about 50 kilometers northeast of Zudañez, Chuquisaca, Bolivia.

PARATYPES: C.M. Nos. 2758 and 2759, females, from Yungas de Cochabamba, Bolivia, obtained by J. Steinbach.

DIAGNOSIS: Related to *M. annellatus balzani* from which it differs in having two postoculars, black bands, occasionally interrupted, two to three ventrals long as against four to five in *M. a. balzani.*

DESCRIPTION OF HOLOTYPE: The rostral is approximately as wide as high; the prefrontals are a little longer than the internasals. The frontal is as long as its distance from the snout and a little shorter than the parietals. The latter are as long as their distance from the anterior border of the prefrontals. There is one anterior and one posterior temporal. The holotype has 215 ventrals and 31 subcaudals, or a total of 246.

The black of the snout extends to the anterior part of the parietals and the anterior half of the frontal, forming a curved border. The light nuchal cross band covers most of the parietals, all of the first temporal, the anterior part of the posterior temporal, and the fifth and sixth supralabials. The head is light inferiorly except for the upper part of the first three infralabials. The mental is light, with dark borders, and there is also dark spotting on the borders of some infralabials and chin shields. The black nuchal band encompasses five dorsals and four ventrals and covers the posterior tips of the parietals, all the seventh supralabial, and the posterior tips of the second pair of chin shields. There are 20 black bands on the body and five on the tail. The black bands on the body encompass three dorsals and two ventrals; the band above the anus is incomplete ventrally. The red bands are seven to 10 dorsals and ventrals long. The yellow rings bordering the black ones are scarcely indicated, being about one-half to one scale long. The scales in the red bands have dark brown tips and irregular black mottling. The belly is light, with a large black spot on two of the red bands.

The holotype measures 425 mm., of which the tail is 39 mm. The ratio of tail length to total length is 0.092.

DESCRIPTION OF PARATYPES: The general characteristics of the paratypes are similar to those of the holotype except that the paratypes have two posterior temporals. Also, the black color of the snout covers all of the frontal and projects backward along the interparietal suture. Most of the second pair of chin shields is black. The specimens have

21 and 25 black body bands on the body and five on the tail. All but the first six bands of C.M. No. 2758 are incomplete ventrally. Both paratypes have irregular black spots on the ventrals. They have, respectively, 211 and 209 ventrals, and 27 and 29 subcaudals, each with a total of 238.

NOTES: This is the southernmost subspecies of *M. annellatus,* an Andean element from the eastern side of the mountains.

### *Micrurus annellatus montanus* Schmidt

*Micrurus annellatus montanus* SCHMIDT, 1954, p. 322. Type locality: Camp 4, about 10 kilometers north of Santo Domingo Mine, Puno, Peru.

DISTRIBUTION: Southeastern Peru to central Bolivia.

NOTES: This form is scarcely distinguishable from *M. a. annellatus* except for the somewhat inconstant melanism in the red zones and a wider parietal light band. It intergrades with *M. a. balzani* in southern Peru and the adjacent regions of Bolivia.

### *Micrurus averyi* Schmidt

*Micrurus averyi* SCHMIDT, 1939, p. 45, fig. 5. Type locality: Courantyne District, near Brazilian border, at latitude 1° 40′ N., longitude 58° W., Guyana (former British Guiana).

DISTRIBUTION: Known only from the type locality.

### *Micrurus bernadi* (Cope)

*Elaps bernadi* COPE, 1887, p. 87. Type locality: Zacualtipan, Hidalgo, Mexico.
*Micrurus bernadi:* SCHMIDT, 1933, p. 40. SMITH AND TAYLOR, 1945, p. 172.

DISTRIBUTION: Western Hidalgo and northern Puebla, Mexico.

### *Micrurus bocourti bocourti* (Jan)

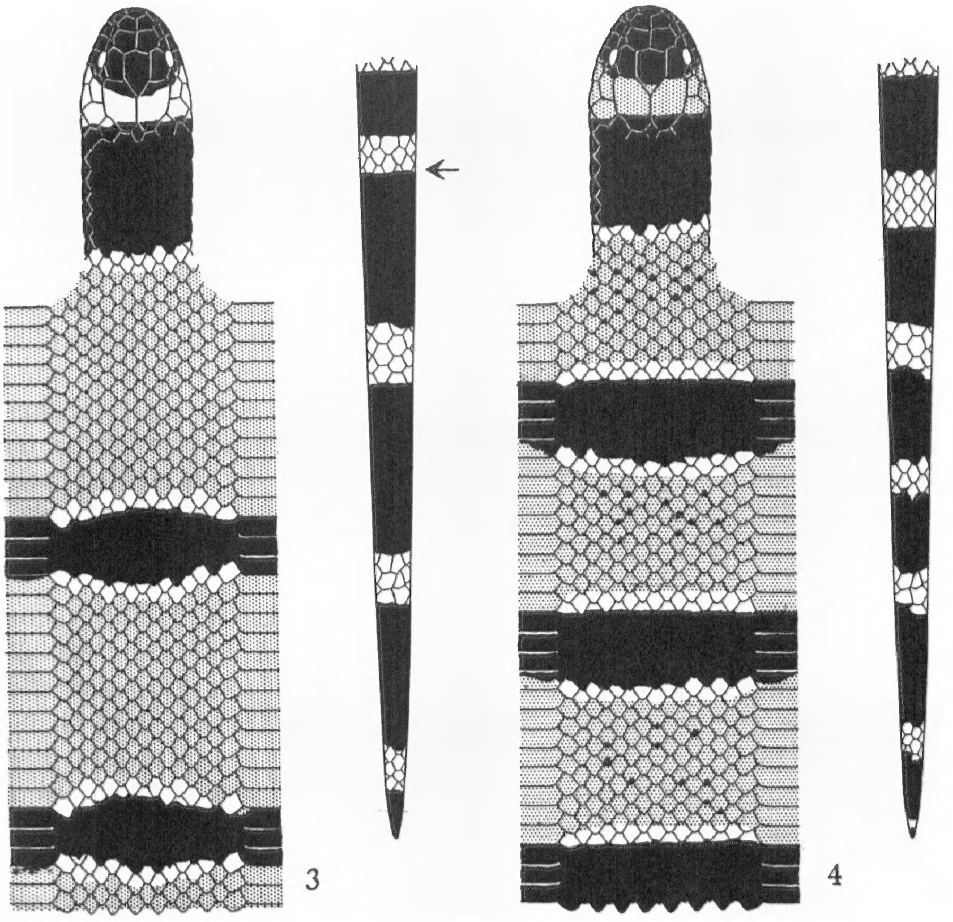
*Elaps bocourti* JAN, 1872, pl. 6, fig. 2. Type locality: "Unknown," restricted herein to Río Daule, Provincia de Guayas, Ecuador.
*Micrurus ecuadorianus* SCHMIDT, 1936a, p. 196. Type locality: Río Daule, western Ecuador.
*Micrurus ecuadorianus ecuadorianus:* J. A. PETERS, 1960, p. 530.

DISTRIBUTION: Western Ecuador.

NOTES: Jan's type, collected by Liataud, is still preserved in the Muséum National d'Histoire Naturelle in Paris (M.H.N.P. No. E-334/2). It obviously represents this form, although it was designated as one of the syntypes for *M. circinalis* by Duméril, Bibron, and Duméril (1854).

### *Micrurus bocourti sangilensis* Nicéforo María

*Micrurus ecuadorianus sangilensis* NICÉFORO MARÍA, 1942, p. 98, pls. 3–10. Type locality: San Gil, Santander, Colombia. SCHMIDT, 1955, p. 344.




FIGS. 3, 4. Color pattern of *Micrurus*. 3. *Micrurus bogerti*, new species (Z.M.H. No. 2303). 4. *Micrurus browni importunus*, new subspecies (B.M. No. 64.1.26.41A). In life stippled areas are red; white areas, white or yellow; and black areas, black. Arrow indicates the position of the anal plate.

DISTRIBUTION: The region between the Cordillera Central and the Cordillera Oriental, northern Colombia.

**Micrurus bogerti,** new species

Figure 3

HOLOTYPE: A.M.N.H. No. 96952, a male, obtained by W. Beebe in 1937 when he was a member of the Eastern Pacific Expedition sponsored by the New York Zoological Society.

TYPE LOCALITY: Tangola-Tangola (Tangolunda), east of Puerto Angel, Oaxaca, Mexico.

PARATYPES: Z.M.H. No. 2309, two specimens, a male and a female, from "west coast of Mexico," obtained by Schenk in 1894.

DIAGNOSIS: Differing from congeners in having a pattern that consists of red bands alternating with 16 to 19 black bands narrowly bordered with yellow; scales in red bands not tipped with black, males without supra-anal tubercles. Differing from all subspecies of *Micrurus distans* except *M. d. zweifeli* in having snout uniformly black, and in having more ventrals in males (214 to 216 versus 198 to 214 for all subspecies of *M. distans*). Some or all scales in red bands of *M. diastema* and *M. fulvius* tipped with black, and supra-anal tubercles present on males of *M. browni, M. nuchalis,* and *M. nigrocinctus.*

DESCRIPTION OF HOLOTYPE: The rostral is wider than high; the prefrontals are twice as long as the internasals. The frontal is as long as its distance from the tip of the snout. The parietals are as long as their distance from the snout. There is one anterior and one posterior temporal. There are 215 ventrals and 54 subcaudals, comprising a total of 269.

The yellow-and-red coloration is faded. The uniformly black color of the snout extends to the anterior margin of the parietals, frontal, upper postoculars, the anterior part of the lower postocular, and the anterior three-quarters of the fourth supralabials. The first three infralabials are black, but the rest are white. There is a dark spot on the tip of each chin shield. The black nuchal band projects a little forward on the middorsal line, covering the tips of the parietals and part of the seventh supralabials. There are 19 complete black bands on the body and four more on the tail. The first black band is six scales long dorsally; the rest are three to four dorsals and, usually, three ventrals long. Many black bands are reduced on the first dorsal row to a length of two or two and a half scales. The black bands on the tail are more than twice as long as the light bands that separate them. The first two light bands on the body are 10 dorsals long; the rest are six to seven dorsals long. There are no black tips on the red scales, and the venter is immaculate.

The over-all length of the holotype is 344 mm., of which the tail is 50 mm. The ratio of tail length to total length is 0.145.

DESCRIPTION OF PARATYPES: The cephalic scutellation of the paratypes and their general characteristics are similar to those of the holotype, except that the parietals are a little shorter than their distance from the snout. The black coloration of the snout invariably includes the tip of the frontal. The nuchal black band is six to seven scales in length and reaches the posterior end of the parietals. The yellow bands

are visible; their length encompasses one and a half dorsals on the anterior part of the body, diminishing to one scale and a half scale on the posterior part of the body. The male has additional dark spots on the under side of the head. It has 214 ventrals, 56 subcaudals, four of them undivided, and 16+4 black bands. The female paratype has 224 ventrals and 41 subcaudals, two of them undivided, and 17+4 black bands.

NOTES: This species is known from the extreme southern Pacific coast of Oaxaca. It is named for Dr. Charles M. Bogert, who has been actively exploring Mexico herpetologically, particularly the region of Oaxaca, and who has a remarkable understanding of and appreciation for the local conditions.

*Micrurus browni browni* Schmidt and Smith

*Micrurus browni* SCHMIDT AND SMITH, 1943, p. 29. Type locality: Chilpancingo, Guerrero, Mexico. SMITH AND TAYLOR, 1945, p. 172.
*Micrurus nigrocinctus browni:* SMITH, 1947, p. 73.

DISTRIBUTION: Sierra Madre del Sur of central Guerrero and Oaxaca to Chiapas, Mexico, and the mountains of western Guatemala.

**Micrurus browni importunus,** new subspecies

Figure 4

HOLOTYPE: B.M. No. 64.1.26.41A, a male, collected by Salvin and Godman.

TYPE LOCALITY: Dueñas, about 25 kilometers west-southwest of Guatemala City in the Antigua Basin, Sacatepequez, Guatemala.

PARATYPES: B.M. No. 64.1.26.41B, a male, and No. 64.1.26.163, a female, both from Dueñas, Guatemala, collected by Salvin and Godman; B.M. No. 61.8.12.22, a male from Guatemala, collected by Salvin and Godman.

DIAGNOSIS: Related to *M. browni browni* from which it differs in that males have more subcaudal scales: 51 to 58 as compared to 46 to 51 for Chiapas population of *M. b. browni.* Approaching *M. nigrocinctus zunilensis* in coloration, having yellow bands obscured by brownish overtones that also cover red scales, and a narrow, light, parietal cross band.

DESCRIPTION OF HOLOTYPE: The rostral is wider than high. The prefrontals are nearly three times longer than the internasals. The frontal is a little longer than its distance from the snout but shorter than the parietals; the latter are a little shorter than their distance from the snout. There are one anterior and two posterior temporals. The snout is uniformly black, and the color extends onto the supraoculars and

almost all the frontal, upper postocular, and fourth supralabial. There is a black infralabial stripe covering the mental and part of the first three infralabials. The black nuchal band covers the posterior third of the parietals, all the seventh supralabial, and the sixth and seventh infralabials and projects anteriorly on both pairs of the chin shields. The black nuchal band is five scales long dorsally and four scales ventrally. Each of the 20 black bands on the body is bordered by yellow bands, which fade following preservation. The black bands are three to four dorsals and three ventrals long, except the first two which are nearly four ventrals long. In some individuals the tips of the red scales are black. In some places the light yellow band, one scale in length, can be discerned. On the tail the seven black bands are longer than the white interspaces.

There are 210 ventrals and 51 subcaudals, comprising a total of 261. The over-all length of the holotype is 836 mm., of which 120 mm. represents the tail. The ratio of tail length to total length is 0.143.

DESCRIPTION OF PARATYPES: The paratypes are similar to the holotype except that two specimens have one posterior temporal. In one specimen the black tips are absent from the red scales, but in all specimens the faded yellow bands are from one to one and a half. The male paratypes have from 209 to 211 ventrals, 54 to 58 subcaudals, and 19 to 20 bands on the body, with six to seven bands on the tail. The female has 224 ventrals, 35 subcaudals, and 27+6 black bands on the body and tail.

NOTES: The subspecies *M. n. zunilensis* and *M. b. importunus* apparently represent the northernmost and southernmost populations of their respective species and overlap considerably in distribution. The name *importunus* (Latin for intruder) alludes to the intrusion of the subspecies into the distribution of *M. nigrocinctus* rassenkreis.

### *Micrurus browni taylori* Schmidt and Smith

*Micrurus nuchalis taylori* SCHMIDT AND SMITH, 1943, p. 30. Type locality: Acapulco, Guerrero, Mexico.

DISTRIBUTION: Acapulco region and lower piedmont of Guerrero, Mexico.

NOTES: This subspecies intergrades with *M. browni browni* between Acapulco and Chilpancingo.

### *Micrurus carinicauda carinicauda* SCHMIDT

*Micrurus carinicauda* SCHMIDT, 1936a, p. 194. Type locality: Orope, Zulia, Venezuela.

*Micrurus carinicaudus carinicaudus:* SCHMIDT, 1955, p. 343.

DISTRIBUTION: From northern Venezuela to Norte de Santander, Colombia.

*Micrurus carinicauda antioquiensis* Schmidt

*Micrurus antioquiensis* SCHMIDT, 1936a, p. 195. Type locality: Santa Rita, north of Medellín, Colombia.

*Micrurus carinicaudus antioquiensis:* SCHMIDT, 1955, p. 343.

DISTRIBUTION: Cauca Valley, Colombia.

NOTES: This subspecies intergrades with *M. c. carinicauda* in central Magdalena Valley in Colombia, and with *M. c. transandinus* in northern Ecuador.

*Micrurus carinicauda colombianus* (Griffin)

*Elaps colombianus* GRIFFIN, 1916, p. 216. Type locality: Minca, Colombia.

DISTRIBUTION: Santa Marta region in northern Colombia.

NOTES: Snakes of the Santa Marta region have fewer ventrals than *M. c. dumerilii,* not even overlapping the range of that subspecies. It seems probable that in the Santa Marta region, fewer vertebrae are selectively advantageous. A similar situation prevails in *M. dissoleucus melanogenys* and *M. d. nigrirostris.* Except for the differences in number of ventrals, the two populations are hardly distinguishable.

*Micrurus carinicauda dumerilii* (Jan)

*Elaps dumerilii* JAN, 1858, p. 522. Type locality: Cartagena, Colombia.

*Micrurus dumerilii:* SCHMIDT, 1936a, p. 194; 1955, p. 344.

DISTRIBUTION: Lower Magdalena River region to Norte de Santander, northern Colombia.

*Micrurus carinicauda transandinus* Schmidt

*Micrurus transandinus* SCHMIDT, 1936a, p. 195. Type locality: Andagoya, Chocó, Colombia.

*Micrurus carinicaudus transandinus:* SCHMIDT, 1955, p. 343. J. A. PETERS, 1960, p. 530.

DISTRIBUTION: West of the Andes in Colombia and Ecuador.

*Micrurus clarki* Schmidt

*Micrurus clarki* SCHMIDT, 1936b, p. 211. Type locality: Yavisa, Darien, Panama.

DISTRIBUTION: Eastern Costa Rica, Panama to western Colombia.

*Micrurus corallinus* (Merrem)

*Elaps corallinus* MERREM, 1820, p. 144. Type locality: Rio de Janeiro, Cabo Frio, Brazil. WIED, 1820, p. 108, pl. 4.

*Micrurus corallinus:* AMARAL, 1925a, p. 20. SCHMIDT, 1936, p. 193.

DISTRIBUTION: Central and southern Brazil, south of the Amazon basin, to Uruguay and northern Argentina.

*Micrurus decoratus* (Jan)

*Elaps decoratus* JAN, 1858, p. 525, pl. B. Type locality: Mexico (error).

*Elaps fischeri* AMARAL, 1921, p. 59, pl. 2, figs. 1–5. Type locality: Serra Bocaina, São Paulo, Brazil.

*Elaps ezequieli* LUTZ AND MELLO, 1922, p. 235, pl. 31. Type locality: Caxambú, Minas Gerais, Brazil.

*Micrurus decoratus:* AMARAL, 1926a, p. 32. SCHMIDT, 1936b, p. 200.

DISTRIBUTION: Eastern Brazil from Rio de Janeiro to Santa Catarina.

*Micrurus diastema diastema* (Duméril, Bibron, and Duméril)

*Elaps diastema* DUMÉRIL, BIBRON, AND DUMÉRIL, 1854, p. 1222. Type locality: Mexico.

*Elaps epistema* DUMÉRIL, BIBRON, AND DUMÉRIL, 1854, p. 1222. Type locality: Mexico.

*Elaps corallinus* var. *crebipunctatus* W. PETERS, 1869, p. 877. Type locality: Matamoras, Puebla, Mexico.

*Micrurus affinis affinis:* (*nec* Jan) SCHMIDT, 1933, p. 36. SMITH AND TAYLOR, 1945, p. 171.

DISTRIBUTION: Central Veracruz and eastern Puebla, Mexico.

NOTES: The syntypes of *M. diastema* in the Paris Museum represent the central Veracruz population. Several specimens from Veracruz have the black bands reduced or interrupted ventrally, as does also M.H.N.P. No. E337/3, the syntype of *M. diastema* that was selected by Schmidt (1933) as lectotype for this form. His type locality restriction for *M. diastema* as Colima, Mexico, was most unfortunate, and was based on misinformation. The three specimens he mentioned as coming "definitely from Colima" are A.M.N.H. Nos. 19705, 19707, and 19709, collected by P. D. R. Rüthling but without specific locality. They were discussed by Zweifel (1959).

*Micrurus diastema affinis* (Jan)

*Elaps affinis* JAN, 1858, p. 525. Type locality: Mexico.

*Micrurus affinis affinis: (partim)* SCHMIDT, 1933, p. 36.

DISTRIBUTION: Northern Oaxaca, Mexico.

NOTES: This form has been misinterpreted, and the name has been misapplied to the central Veracruz population. Its type specimen, well preserved in the Paris Museum, conforms to the population of northern Oaxaca.

This group, known previously as the *M. affinis* complex, is one of the most confused rassenkreis within the New World coral snakes. There is

evidence for cline characteristics as well as large intergradation zones between the recognized subspecies. Moreover, several types have been misinterpreted or neglected. *Micrurus diastema* is the oldest name available for a subspecies within this group and is, therefore, used as the specific name.

*Micrurus diastema aglaeope* (Cope)

*Elaps aglaeope* Cope, 1859, p. 344. Type locality: Honduras.
*Micrurus affinis aglaeope:* Schmidt, 1936b, p. 214.

Distribution: Mountains of northwestern Honduras.

*Micrurus diastema alienus* (Werner)

*Elaps alienus* Werner, 1903, p. 249. Type locality: Unknown, "Perhaps Venezuela or Ecuador," restricted herein to Chichén Itzá, Yucatán, Mexico.
*Micrurus affinis mayensis* Schmidt, 1933, p. 37. Type locality: Chichén Itzá, Yucatán, Mexico. Smith and Taylor, 1945, p. 172.

Distribution: Yucatán peninsula: in Yucatán and northern Quintana Roo, Mexico.

Notes: On the type specimen of *M. alienus* the black bands are reduced or absent, and almost all the head, including the parietals, is black. These characteristics are known to occur in specimens from the Yucatán peninsula that have been called *M. affinis mayensis*. Other characteristics of the type specimen also fall within the range of variation of the Yucatán population but not of the populations in the southern portion of the Yucatán peninsula and northern Guatemala.

*Micrurus diastema apiatus* (Jan)

*Elaps apiatus* Jan, 1858, p. 522. Type locality: Veracruz, Mexico.
*Micrurus affinis apiatus:* Schmidt, 1933, p. 36. Smith and Taylor, 1945, p. 172. Stuart, 1963, p. 126.

Distribution: Moderate elevations of the Caribbean slopes from Chiapas, Mexico, to central Guatemala; probably also in Tabasco and southern Veracruz.

**Micrurus diastema macdougalli,** new subspecies
Figure 5

Holotype: A.M.N.H. No. 65163, a male, collected by T. C. MacDougall on March 5, 1944.

Type Locality: El Modelo, Río Chalchijapa and Río del Corte, Oaxaca, Mexico.

Paratype: A.M.N.H. No. 65162, a male, from the type locality, collected by T. C. MacDougall on March 6, 1944.

DIAGNOSIS: Related to *M. diastema affinis* from which it differs in having fewer ventrals and subcaudals in males: 200 to 201 ventrals as against 203 to 211 for *M. d. affinis,* and 49 to 50 subcaudals as against 52 to 56. Differing from *M. d. affinis* also in having black tail bands narrower than yellow bands, fewer black spots on red bands, in having all supralabials partially yellow and black nuchal band not, or only barely, reaching parietal tips.

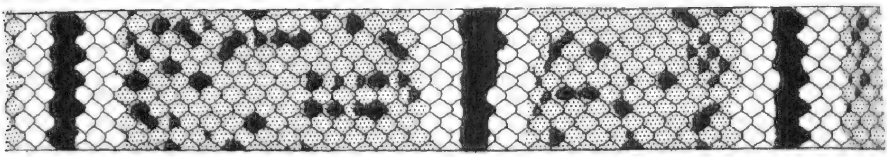


FIG. 5. Dorsal color pattern at midbody of *Micrurus diastema macdougalli,* new subspecies (A.M.N.H. No. 65163). In life stippled areas are red; white areas, white or yellow; and black areas, black.

DESCRIPTION OF HOLOTYPE: The rostral is a little wider than high. The prefrontals are almost twice as long as the internasals. The frontal is a little longer than its distance from the snout, but shorter than the parietals. There are 1 + 1 temporals, and a large posttemporal reaching beyond the parietal tips. The holotype has 200 ventrals and 50 subcaudals, comprising a total of 250.

The black coloration of the snout extends onto the supraoculars and a little more than the anterior half of the frontal. On the right side the supralabials are yellow, whereas on the left side the upper part of the first supralabials is black, except the first supralabial which is all black. There are some spots on the base of the rostral. The head is light inferiorly except for dark spots on the mental and the first infralabial and the posterior tips of the second pair of chin shields. The black nuchal band is two to three dorsals long but does not reach the parietal tips. There are 15 + 8 black bands on the body and tail. The latter are dorsally narrower than the yellow ones that separate them. The black bands on the body are one to two dorsals and ventrals long and bordered by yellow bands one and a half to two scales long dorsally. The red bands are 10 to 14 dorsals long, with irregular black spots covering usually one or more dorsal scales. There are some black spots on the red bands ventrally.

The holotype measures 574 mm., of which 90 mm. is the tail length. The ratio of tail length to total length is 0.157.

DESCRIPTION OF PARATYPE: In most characteristics it is similar to the

holotype. It has all the first supralabial bases and almost all the rostral and part of the anterior nasal light. The black nuchal band projects and covers the parietal tips and is interrupted ventrally. There is a black spot on the first pair of chin shields. The paratype has 16 + 8 black bands on the body and tail, and 201 ventrals and 49 subcaudals.

NOTES: The new subspecies is named for Mr. T. C. MacDougall who has made valuable collections in the Tehuantepec region that have greatly facilitated the herpetological survey of that region.

*Micrurus diastema sapperi* (Werner)

*Elaps fulvius* var. *sapperi* WERNER, 1903, p. 350. Type locality: Guatemala.

*Elaps guatemalensis* AHL, 1927, p. 251. Type locality: Guatemala.

*Micrurus affinis stantoni* SCHMIDT, 1933, p. 36. Type locality: Belize, British Honduras.

*Micrurus affinis alienus:* (*nec* Werner) SCHMIDT, 1936a, p. 212. SMITH AND TAYLOR, 1945, p. 171. STUART, 1963, p. 126.

DISTRIBUTION: Southern Quintana Roo, Campeche, and Tabasco to southern Veracruz in Mexico, lowlands of northern Guatemala and British Honduras.

NOTES: As already suggested by Stuart (1963), there is a cline in several characteristics within this subspecies, starting in Guatemala and extending into Mexico. The name *alienus* should be applied to the subspecies of the Yucatán peninsula and not to the present one.

*Micrurus dissoleucus dissoleucus* (Cope)

*Elaps dissoleucus* COPE, 1859, p. 345. Type locality: Venezuela (restricted to Maracaibo, Zulia, Venezuela, by Roze, 1955).

*Micrurus dissoleucus dissoleucus* SCHMIDT, 1936a, p. 202. ROZE, 1955, p. 478.

DISTRIBUTION: From northeastern Colombia to eastern Venezuela.

*Micrurus dissoleucus dunni* Barbour

*Micrurus dunni* BARBOUR, 1923, p. 15. Type locality: Ancon, Canal Zone, Panama.

*Micrurus dissoleucus dunni:* SCHMIDT, 1936b, p. 203.

DISTRIBUTION: From the Canal Zone to eastern Panama.

*Micrurus dissoleucus melanogenys* (Cope)

*Elaps melanogenys* COPE, 1860, p. 72. Type locality: South America (restricted to Santa Marta region, Colombia, by Schmidt, 1955).

*Elaps hollandi* GRIFFIN, 1916, p. 218, pl. 18, figs. 10–12. Type locality: Bonda, Colombia.

*Micrurus dissoleucus melanogenys:* SCHMIDT, 1936a, p. 203.

DISTRIBUTION: Santa Marta region in northeastern Colombia.

*Micrurus dissoleucus nigrirostris* Schmidt

*?Elaps gravenhorstii* Jan, 1858, p. 523. Type locality: Brazil (error).

*Micrurus dissoleucus nigrirostris* Schmidt, 1955, p. 355. Type locality: Barranquilla, Colombia.

Distribution: Lower Magdalena region, northern Colombia.

Notes: Judged by the plate accompanying Jan's description and by the number of ventrals and subcaudals of the type, as given by Jan, *Elaps gravenhorstii,* most probably, represents this subspecies. However, since (1) its type specimen apparently has been lost, (2) the name usually has been included in the synonymy of *M. lemniscatus*, and (3) the name has never applied to any subspecies of *M. dissoleucus,* a recommendation for suppressing the name is being prepared for submission to the International Commission on Zoological Nomenclature.

*Micrurus distans distans* (Kennicott)

*Elaps distans* Kennicott, 1860, p. 338. Type locality: Batosegachie (=Batosegachic), Chihuahua, Mexico.

*Micrurus diastema distans: (partim)* Schmidt, 1933, p. 39. Smith and Taylor, 1945, p. 173.

*Micrurus distans distans:* Zweifel, 1959, p. 7.

Distribution: Southwestern Chihuahua and southern Sonora southward through Sinaloa to northwestern Nayarit, Mexico.

*Micrurus distans michoacanensis* (Dugès)

*Elaps diastema* var. *michoacanensis* Dugès, 1891, p. 487, pl. 32. Type locality: Michoacán, Mexico.

*Micrurus diastema michoacanensis:* Schmidt and Smith, 1943, p. 28. Smith and Taylor, 1945, p. 173.

*Micrurus distans michoacanensis:* Zweifel, 1959, p. 9.

Distribution: The Balsas River basin of Michoacán and Guerrero, Mexico.

**Micrurus distans oliveri,** new subspecies

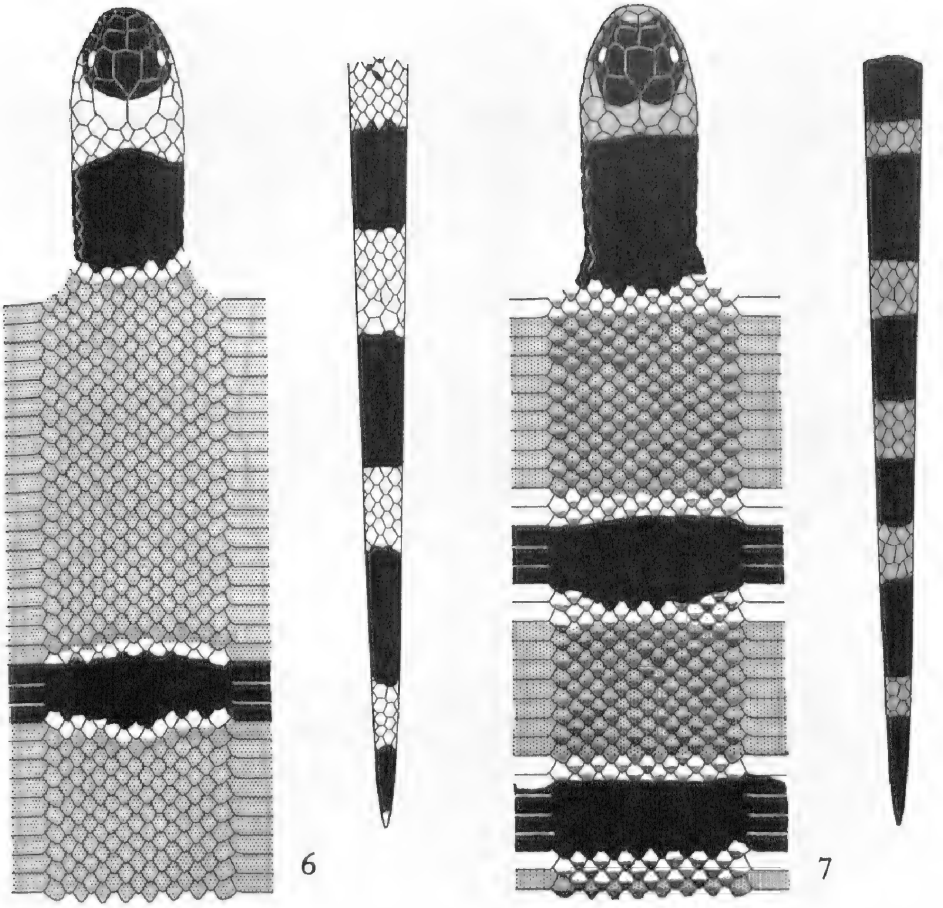
Figure 6

*Micrurus diastema diastema:* (*nec* Duméril, Bibron, and Duméril) Schmidt and Smith, 1943, p. 28. Smith and Taylor, 1945, p. 172.

Holotype: A.M.N.H. No. 12780, a male, obtained by P. D. R. Rüthling, on March 28, 1919.

Type Locality: Periquillo, Colima, Mexico.

Paratypes: A.M.N.H. No. 85752, a male, 31 kilometers northwest of Manzanillo, Colima, Mexico, collected by C. M. Bogert, January 24, 1961. A.M.N.H. No. 19837, a female, east of Manzanillo, Colima,




FIGS. 6, 7. Color pattern of *Micrurus*. 6. *Micrurus distans oliveri,* new subspecies (A.M.N.H. No. 12780). 7. *Micrurus distans zweifeli,* new subspecies (C.A.S. No. 95769). In life stippled areas are red; white areas, white or yellow; and black areas, black.

Mexico, P. D. R. Rüthling, April 19, 1919. M.C.Z. No. 11416, a male, G. Gluckert. U.M.M.Z. No. 80230, a female, Hacienda Paso del Río, Armería, Colima, Mexico, J. A. Oliver, July 25, 1935. U.M.M.Z. No. 80231, a female, 15 kilometers northwest of Hacienda Paso del Río, Armería, Colima, Mexico, J. A. Oliver, July 29, 1935.

DIAGNOSIS: Differing from other subspecies of *M. distans* in both color pattern and scutellation. Black tail bands of *M. d. oliveri* approximately as long as or somewhat shorter than white bands, whereas in other subspecies black rings much longer. Having more subcaudals but fewer ventrals than other subspecies; ranges, with those of other subspecies

in parentheses: subcaudals of males, 53 to 55 (47 to 52), of females, 43 to 44 (38 to 41); ventrals of males, 198 to 209 (208 to 214), of females, 216 to 218 (222 to 235).

DESCRIPTION OF HOLOTYPE: The rostral is a little wider than high. The internasals are longer than wide. The prefrontals are approximately one and a half times the length of the internasals. The frontal is as long as its distance from the snout, but shorter than the parietals. There is one anterior and one posterior temporal; on the left side the posterior part of the posterior temporal is divided, forming an additional shield. There are 209 ventrals and 55 subcaudals, comprising a total of 264.

The red coloration is faded. The snout is uniformly black, and this color extends posteriorly over the anterior one-third of the parietals, covering all the frontal, both postoculars, and the upper anterior part of the first temporal, as well as the first three supralabials and the upper part of the fourth. The base of the first three supralabials is white or has light spots. Inferiorly, the head is white, with some dark mottling on the mental and the first three infralabials. The mottling is to some extent concentrated along the borders of the first chin shields. There are 12 complete black bands on the body, three scales long both dorsally and ventrally, and five on the tail, the first three of which are shorter than the light (yellow) ones that separate them. The black nuchal band is six dorsals long, diminishing to two scales ventrally. Before the specimen was preserved, every black band on the body was presumably bordered by a white (yellow) band one scale long. This is barely indicated.

The over-all length of the holotype is 649 mm., and the tail is 103 mm. in length. The ratio of tail length to total length is 0.159.

DESCRIPTION OF PARATYPES: The paratypes are similar to the holotype. In some paratypes, however, all the supralabials as well as the rostral and internasals are light, but the black coloration of the snout invariably extends onto the tip of the frontal. There are no black tips on the red bands.

The range of ventrals in males is 198 to 206, in females, 216 to 218. The subcaudals in males range in number from 53 to 55, in females, 43 to 44. The males have, respectively, 12 and 13 black bands on the body, and the females, 13 and 14. There are from three to six black bands on the tail of males and from four to five on the tail of females.

NOTES: This species has been confused with *M. diastema*, a form from central Veracruz that has dark supralabials and snout, and black tips on the red scales. The new subspecies is named for Dr. James A. Oliver, the distinguished herpetologist, who collected two of the paratypes.

## **Micrurus distans zweifeli,** new subspecies

Figure 7

*Micrurus diastema distans:* (*nec* Kennicott) SCHMIDT AND SMITH, 1943, p. 28.
*Micrurus diastema proximans* (*partim*) SMITH AND CHRAPLIWY, 1958, p. 270.

HOLOTYPE: C.A.S. No. 95769, a male, collected by A. Greer, on July 19, 1964.

TYPE LOCALITY: Laguna Santa María, Nayarit, Mexico, between elevations of 2000 and 4000 feet.

PARATYPES: U.S.N.M. No. 67374, a female, Magdalena, Jalisco, Mexico, C. E. Elliot. E.A.L. No. 649, a female, 8.5 miles northwest of Magdalena, Jalisco, Mexico, E. A. Liner and A. H. Chancy, July 11, 1962.

DIAGNOSIS: Differing from other subspecies of *M. distans* in having black or dark gray tips on red scales of body (immaculate in other forms) and in having more black bands on body: 19 to 20 rather than seven to 17. Also, ventrals more numerous in *M. d. zweifeli,* for only male has 217 ventrals in contrast to a range of 198 to 214 in other subspecies; two female paratypes having 237 and 242 ventrals, instead of 216 to 235.

DESCRIPTION OF HOLOTYPE: The rostral is approximately as high as wide, and the prefrontals are twice as long as the internasals. The frontal is hexagonal, longer than its distance from the snout, but shorter than the parietals. There is one anterior and one posterior temporal. There are 217 ventrals and 48 subcaudals, comprising a total of 265.

The black of the snout extends back to the frontal tip and two-thirds of the parietals and terminates in a sinuous posterior border. The lower part of the supralabials is light and there is a light gray rostral-internasal spot. Inferiorly, the head is almost white, with dark mottlings on the border of the first infralabials and the anterior chin shields. The body has 19 black bands, complete ventrally, and usually four dorsals and three ventrals long. The white (yellow) rings bordering the black bands are one to two scales long. The black nuchal band is eight dorsals and three ventrals long, beginning behind the parietal tips. The red bands are five to six dorsals at midbody, and the tips of the red scales are dark gray. There are six black bands on the tail, longer than the light gray interspaces that separate them.

The over-all length of the holotype is 725 mm., of which 106 mm. represents the tail. The ratio of tail length to over-all length is 0.146.

DESCRIPTION OF PARATYPES: The paratypes are similar to the holotype. Both paratypes have more pronounced black tips on the red scales,

though they are absent from some. Both paratypes have light supralabial spots and a light spot on the snout. They have, respectively, 237 and 242 ventrals and 39 and 41 subcaudals. There are 19 and 20 black bands on the body and four on the tail.

NOTES: One of the paratypes of *M. distans zweifeli* (U.S.N.M. No. 67374) was designated a paratype of *M. diastema proximans* by Smith and Chrapliwy (1958), but this form is quite distinct from *M. diastema.* This new subspecies is named for Dr. Richard G. Zweifel, who distinguished *M. distans* from other species in 1959 and suggested that U.S.N.M. No. 67374 might represent a distinct population of *M. distans.* Additional material from mountains or elevated portions of Jalisco and Nayarit has confirmed this view. *Micrurus d. zweifeli* intergrades with *M. d. distans* in central Nayarit, Mexico.

*Micrurus elegans elegans* (Jan)

*Elaps elegans* JAN, 1858, p. 524. Type locality: Mexico.
*Micrurus elegans elegans:* SCHMIDT, 1933, p. 32. SMITH AND TAYLOR, 1945, p. 173.

DISTRIBUTION: Central Veracruz and eastern Oaxaca to western Tabasco, Mexico.

*Micrurus elegans veraepacis* Schmidt

*Micrurus elegans verae-pacis* SCHMIDT, 1933, p. 32. Type locality: Campur, Alta Verapaz, Guatemala.

DISTRIBUTION: From southern Tabasco and Chiapas, Mexico, to Alta Verapaz, Guatemala.

*Micrurus ephippifer* (Cope)

*Elaps ephippifer* COPE, 1886, p. 281. Type locality: Pacific side of the Isthmus of Tehuantepec (Oaxaca, Mexico).
*Micrurus ephippifer:* SCHMIDT, 1933, p. 38. SMITH AND TAYLOR, 1945, p. 174.

DISTRIBUTION: Sierra Madre del Sur in Oaxaca to the Isthmus of Tehuantepec, Oaxaca, Mexico.

*Micrurus filiformis filiformis* (Günther)

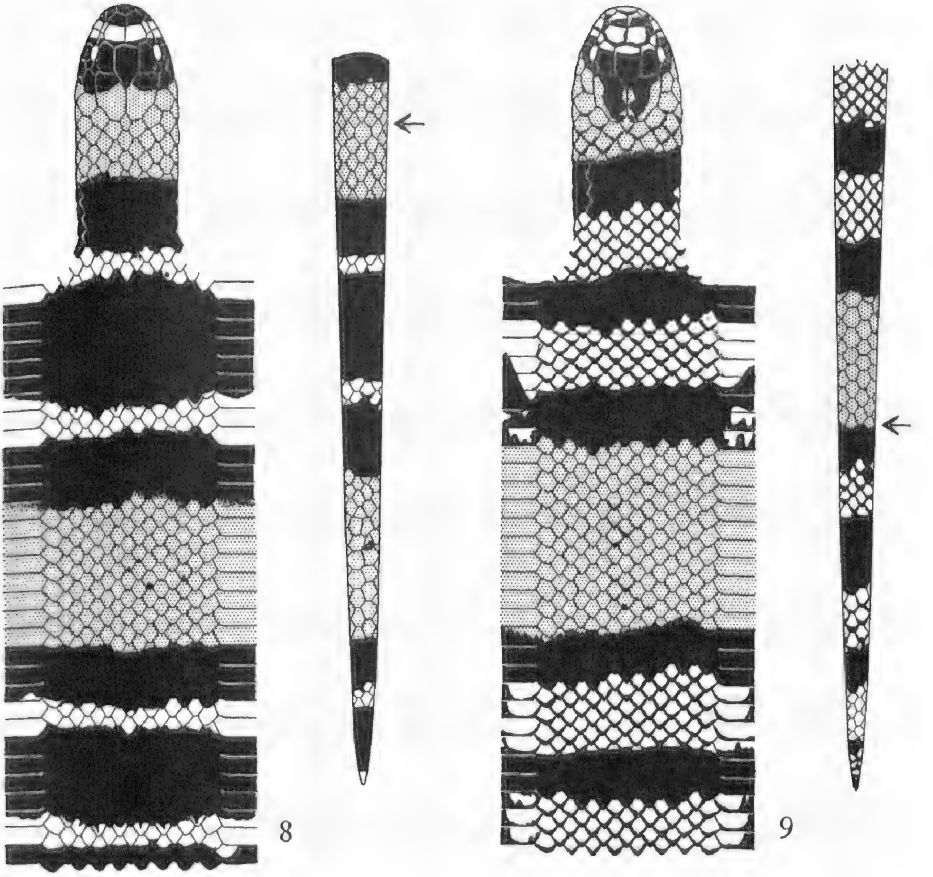
*Elaps filiformis* GÜNTHER, 1859, p. 86, fig. 18-B. Type locality: Pará, Brazil.
*Micrurus filiformis:* AMARAL, 1925a, p. 19. Schmidt, 1936a, p. 201.

DISTRIBUTION: Northern Amazon region, extreme southern Colombia to northern Peru.

**Micrurus filiformis subtilis,** new subspecies

Figure 8

HOLOTYPE: A.M.N.H. No. 4461, a male, obtained by H. Schmidt




FIGS. 8, 9. Color pattern of *Micrurus*. 8. *Micrurus filiformis subtilis,* new subspecies (A.M.N.H. No. 4461). 9. *Micrurus frontalis brasiliensis,* new subspecies (U.M.M.Z. No. 108880). In life stippled areas are red; white areas, white or yellow; and black areas, black. Arrows indicate the position of the anal plate.

and S. Weiss in November, 1906.

TYPE LOCALITY: Carurú, Río Vaupés, Colombia-Brazil boundary.

PARATYPES: A.M.N.H. No. 96998, a male, Miraflores, Río Vaupés, Vaupés, Colombia, V. H. Hutchinson and J. Mahoney, November 24, 1965. I.L.S. No. 1544, a female, Puerto Nariño, Amazonas, Colombia, Nicéforo María. I.L.S. No. 1545, a male, La Pedrera, Río Caquetá, Amazonas, Colombia, Fray Miguel de Iparés, 1934.

DIAGNOSIS: Differing from only other subspecies in having two postoculars and in having lower ventral counts in males: 274 to 279 against 283 to 309 in *M. f. filiformis.*

DESCRIPTION OF HOLOTYPE: The rostral is wider than high. The pre-

frontals are a little longer than the internasals. The frontal is as long as its distance from the snout, and the parietals are a little longer than their distance from the snout. There are 1+1 temporals. The specimen has 279 ventrals and 40 subcaudals, or a total of 319.

The snout is black, followed by a white prefrontal cross band, and black frontal cross band that covers all the frontal, anterior part of the parietals, anterior temporal and extends down to the base of the fourth and the fifth supralabials. The posterior part of the head is red, including the first three dorsal rows. The mental and the first six infralabials are black; the rest of the lower side of the head is red. There are 16 black triads on the body and one and two-thirds on the tail. The central black band of a triad is longer than the outer one. The length of a triad on midbody and the adjacent red band is 2-1-4-½-2-5 dorsals. The red bands have a few black tips.

The over-all length of the holotype is 440 mm., including the tail, which is 34 mm. in length. The ratio of tail length to over-all length is 0.077.

Description of Paratypes: In their general characteristics the paratypes are similar to the holotype. The Miraflores specimen has the central black band of the triad only a little longer than the outer ones, and the white bands are one to two dorsals long. There are 274 to 277 ventrals in males and 299 ventrals for the only female, whereas the subcaudals of males vary from 38 to 40 and the female has 34. The males have 14+2 and 16+2½ triads, and the female has 17+2 triads. The largest paratype (I.L.S. No. 1545) has an over-all length of 539 mm.

Notes: The Latin name *subtilis* alludes to its very slender body.

### *Micrurus fitzingeri* (Jan)

*Elaps fitzingeri* Jan, 1858, p. 521. Type locality: Mexico.
*Micrurus fitzingeri:* Schmidt, 1933, p. 38.
*Micrurus fitzingeri fitzingeri:* Smith and Taylor, 1945, p. 174.

Distribution: Central Mexico in Distrito Federal and Morelos.

Notes: Thus far, there is no evidence that this form intergrades with *M. fulvius microgalbineus.*

### *Micrurus frontalis frontalis* (Duméril, Bibron, and Duméril)

*Elaps frontalis* Duméril, Bibron, and Duméril, 1854, p. 1223. Type locality: Corrientes and Misiones, Argentina.
*Elaps baliocoryphus* Cope, 1859, p. 346. Type locality: Buenos Aires, Argentina.
*Micrurus frontalis frontalis:* Schmidt, 1936a, p. 199.
*Micrurus lemniscatus frontalis:* (*partim*) Amaral, 1944, p. 92.

DISTRIBUTION: Southern Brazil and southern Paraguay, including adjacent Argentina.

*Micrurus frontalis altirostris* (Cope)

*Elaps altirostris* COPE, 1859, p. 345. Type locality: South America.
*Elaps heterochilus* MOCQUARD, 1887, p. 39. Type locality: Brazil.
*Micrurus frontalis altirostris:* SCHMIDT, 1936a, p. 199.
*Micrurus lemniscatus multicinctus* (*partim*) AMARAL, 1944, p. 91. Type locality: Texeira Soares, Paraná, Brazil.

DISTRIBUTION: Southern Brazil, Uruguay, and northeastern Argentina.

NOTES: This subspecies intergrades with *M. f. frontalis* is southeastern Brazil. The type specimen of *M. l. multicinctus* is probably an intergrade between *M. f. frontalis* and *M. f. altirostris.*

**Micrurus frontalis brasiliensis,** new subspecies

Figure 9

HOLOTYPE: U.M.M.Z. No. 108880, a male, obtained by J. R. Bailey in 1942.

TYPE LOCALITY: Barreiras, Bahia, Brazil.

PARATYPES: U.M.M.Z. No. 108881, a female, Barreiras, Bahia, Brazil, J. R. Bailey, 1942. U.M.M.Z. No. 108878, a male, Januario, Minas Gerais, Brazil, J. R. Bailey, 1942. A.M.N.H. No. 90361, a male, Santa Isabel, Ilha do Bananal, Rio Araguaia, Goiás, Brazil, B. Malkin, August 14, 1957. M.N.R. Nos. 2494, 2496, males, Barreiras, Bahia, Brazil. M.N.R. No. 2497, a female, Manga, Minas Gerais, Brazil. M.C.Z. No. 3298, a male, Santa Cruz, Bahia (?), Brazil, Boarget.

DIAGNOSIS: Related to *M. frontalis frontalis,* differing in having internasal and prefrontal scales light, with some dark markings and coloration of parietals much reduced. Females of *M. f. brasiliensis* having fewer subcaudals than *M. f. frontalis:* 16 to 18 as against 21 to 25.

DESCRIPTION OF HOLOTYPE: The rostral is wider than high; the prefrontals are twice as long as the internasals. The frontal is shorter than its distance from the snout, and the parietals are as long as their distance from the internasals. There are 1 + 1 temporals. The holotype has 228 ventrals and 22 subcaudals, a total of 250.

The scales of the snout are light, with dark borders and spots. There is a black interorbital band that extends backward and irregularly covers the central part of the parietals. Parts of the parietals and postparietals are red. Inferiorly, the head is light, with dark spots on the mental and on some infralabials. There are $12 + 1\frac{2}{3}$ black triads on the body and tail. The first band of the first black triad does not reach the parietal

scales. The white bands are longer than the black bands, whereas the red bands that separate the triads are more than two times longer than the white ones. The red scales are virtually immaculate, whereas the scales in the white bands have pronounced black borders. The black bands of all but the first triad expand and fuse on the midventral line.

The over-all length of the type specimen is 885 mm., of the tail, 50 mm. The ratio of tail length to over-all length is 0.056.

DESCRIPTION OF PARATYPES: The paratypes are similar in general to the holotype. In several specimens the parietals are nearly all red, and the infracephalic scales are all light. The black bands of A.M.N.H. No. 90361 are as long as the light ones or, in some instances, even longer.

There are from 223 to 242 ventrals in males and from 229 to 238 in females. The number of subcaudals ranges from 22 to 25 in males and 16 to 18 in females. The males have 10 to 13 triads on the body, and both females have 12.

NOTES: This is the northernmost subspecies of *M. frontalis*. Although the light snout of *M. f. brasiliensis* resembles the light internasal band characteristic of *M. lemniscatus* and *M. ibiboboca*, the low number of subcaudals of *M. f. brasiliensis* clearly indicates its relationship to *M. frontalis*.

### *Micrurus frontalis pyrrhocryptus* (Cope)

*Elaps pyrrhocryptus* COPE, 1862, p. 347. Type locality: Vermejo River, Argentine Chocó.

*Elaps simonsii* BOULENGER, 1902b, p. 338. Type locality: Cruz del Eje, Córdoba, Argentina.

*Micrurus pyrrhocryptus:* SCHMIDT, 1936b, p. 199.

*Micrurus frontalis pyrrhocryptus:* SHREVE, 1953, p. 5.

*Micrurus lemniscatus frontalis:* (*partim*) AMARAL, 1944, p. 92.

*Micrurus tricolor* HOGE, 1956, p. 67, figs. 1–4, 6. Type locality: Garandazal, Mato Grosso, Brazil.

DISTRIBUTION: Southwestern Mato Grosso in Brazil, western and southwestern Bolivia, and adjacent Paraguay, southward to Mendoza and Santa Fé, Argentina, east of the Andes.

### *Micrurus fulvius fulvius* (Linnaeus)

*Coluber fulvius* LINNAEUS, 1766 (1766–1767), p. 381. Type locality: Carolina (restricted to Charleston, South Carolina, United States, by Schmidt, 1953).

*Micrurus fulvius fulvius:* SCHMIDT, 1928, p. 64.

*Micrurus fulvius barbouri* SCHMIDT, 1928, p. 64. Type locality: Paradise Key, Dade County, Florida, United States.

DISTRIBUTION: Northern Carolina to the southern tip of Florida, and the Gulf coastal plain to Mississippi; also Kentucky and Tennessee.

**Micrurus fulvius maculatus,** new subspecies

Figure 10

HOLOTYPE: Z.M.H. No. 5685, a male, collected by E. Kallert, on February 10, 1930.

TYPE LOCALITY: Tampico, Tamaulipas, Mexico.

PARATYPES: B.M. No. 1936.6.6.11, a female, Tampico, Tamaulipas, Mexico, obtained by "Barker." B.M. No. 48.7.28.83, a female, and B.M. No. 48.7.28.85, a male, both from Mexico.

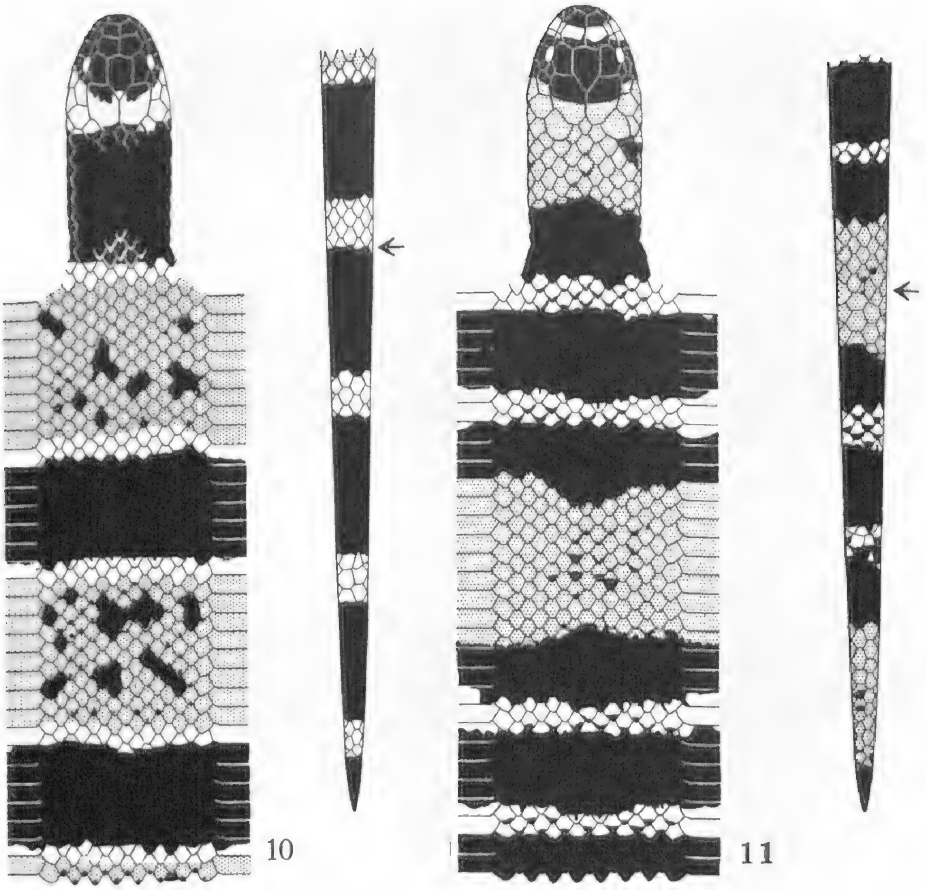
DIAGNOSIS: Differing from all other subspecies of *M. fulvius* in having fewer ventrals: 185 to 192 in males (as compared to 198 to 217 for all other subspecies combined) and 205 to 208 in females (as compared to 216 to 232 for all the other subspecies combined); also irregular black tips on red scales in many instances fusing to form black spots covering several dorsal scales.

DESCRIPTION OF HOLOTYPE: The rostral is approximately as high as wide, almost a perfect triangle. The prefronatals are longer than their distance from the snout, and the frontal is approximately as long as its distance from the snout, but shorter than the parietals. Some of the scales on the snout are slightly damaged. There are 192 ventrals and 43 subcaudals, totaling 235.

The black coloration of the snout extends back to the anterior one-third of the parietals, but there is a light notch extending from the yellow parietal band that penetrates the black area from behind and covers also the frontal tip. The black nuchal band covers the tips of the parietals and the posterior part of the seventh supralabial. Inferiorly, the head is yellow, except for the mental and the first three infralabials which are almost black. The black nuchal band is seven dorsals and six ventrals long. There are 15+5 black bands on the body and tail. The black bands are five to six dorsals and four to five ventrals long, bordered by yellow bands, one to one and a half dorsals and one half to one ventral long. The red bands cover five to nine dorsals, decreasing in size toward the posterior part of the body. Irregular black tips are present on the red scales, some of them fused to form larger black spots that occupy several dorsal scales. There are black spots on the venter, except on the first two red bands.

The over-all length of the holotype is 537 mm., of which 74 mm. represents the tail length. The ratio of the tail length to over-all length is 0.138.

DESCRIPTION OF PARATYPES: The head squamation is similar to that of the holotype. The black coloration of the snout has the posterior light




FIGS. 10, 11. Color pattern of *Micrurus*. 10. *Micrurus fulvius maculatus*, new subspecies (Z.M.H. No. 5685). 11. *Micrurus lemniscatus carvalhoi*, new subspecies (U.S.N.M. No. 76341). In life stippled areas are red; white areas, white or yellow; and black areas, black. Arrows indicate the position of the anal plate.

notch in only one of the specimens. Inferiorly, the head of all three paratypes has some dark mottling and spotting; otherwise the coloration is similar to that of the holotype.

The male has 185 ventrals, 45 subcaudals, and 16+6 black bands on the body and tail. The female paratypes have from 205 to 208 ventrals, 31 subcaudals, and 13 to 17 black bands on the body, with three to four bands on the tail.

NOTES: This subspecies is probably restricted to swampy or humid areas around Tampico, Tamaulipas. It integrades with *M. f. microgalbineus* north and west of the Tampico region.

*Micrurus fulvius microgalbineus* Brown and Smith

*Micrurus fitzingeri microgalbineus* BROWN AND SMITH, 1942, p. 63. Type locality: Seven kilometers south of Antiguo Morelos, Tamaulipas, Mexico.
*Micrurus fitzingeri fitzingeri:* (*nec* Jan) BROWN AND SMITH, 1942, p. 64.

DISTRIBUTION: Southwestern Tamaulipas, central and eastern San Luís Potosí to central Guanajuato, Mexico.

NOTES: This subspecies intergrades with the northern race, *M. fulvius tenere,* in central Tamaulipas.

*Micrurus fulvius tenere* (Baird and Girard)

*Elaps tenere* BAIRD AND GIRARD, 1853, pp. 22, 156. Type locality: San Pedro of Río Grande and New Braunfels, Texas, United States (restricted to the second locality by Schmidt, 1953).
*Elaps tristis* BAIRD AND GIRARD, 1853, p. 23. Type locality: Kemper County, Mississippi; Río Grande, west of San Antonio, Texas.
*Micrurus fulvius tenere:* SCHMIDT, 1933, p. 40. SMITH AND TAYLOR, 1945, p. 174.

DISTRIBUTION: West of the Mississippi River from Louisiana, Arkansas, and Texas to northern Coahuila, Nuevo León, and Tamaulipas, Mexico.

*Micrurus hemprichii hemprichii* (Jan)

*Elaps hemprichii* JAN, 1858, p. 523. Type locality: Colombia.
*Micrurus hemprichi hemprichi:* SCHMIDT, 1953a, p. 166.

DISTRUBITION: From eastern Colombia and southern Venezuela to the Guianas.

*Micrurus hemprichii ortoni* Schmidt

*Micrurus hemprichi ortoni* SCHMIDT, 1953a, p. 166. Type locality: Pebas, Peru. SCHMIDT, 1955, p. 348. J. A. PETERS, 1960, p. 530.

DISTRIBUTION: Upper Amazon of Colombia, Ecuador, and Peru; also Pará, Brazil.

*Micrurus hippocrepis* (Peters)

*Elaps hippocrepis* W. PETERS, 1862, p. 925. Type locality: Santo Tomás, (=Puerto Matías de Galvez), Guatemala.
*Micrurus affinis hippocrepis:* (*partim*) SCHMIDT, 1936b, p. 214.

DISTRIBUTION: The Stann Creek region in eastern British Honduras southward to Puerto Matías de Galvez, Guatemala.

NOTES: The type specimen of this species conforms to a series of specimens known from British Honduras where it is evidently sympatric with *M. diastema sapperi* (*M. affinis alienus* auct.), with which it has been confused in the past.

*Micrurus ibiboboca* (Merrem)

*Elaps ibiboboca* Merrem, 1820, p. 142. Type locality: Brazil.
*Elaps marcgravii* Wied, 1820, p. 109. Type locality: Brazil.
*Micrurus ibiboboca:* Amaral, 1925b, p. 29. Schmidt, 1936a, p. 200.

Distribution: Eastern Brazil.

*Micrurus isozonus* (Cope)

*Elaps isozonus* Cope, 1860, p. 73. Type locality: South America (restricted to Caracas, Venezuela, by Roze, 1955).
*Elaps omissus* Boulenger, 1920, p. 109. Type locality: Venezuela.
*Micrurus isozonus:* Schmidt, 1936a, p. 198. Roze, 1955, p. 485.

Distribution: Northern and central Venezuela to Intendencia Meta, Colombia.

*Micrurus langsdorffi langsdorffi* Wagler

*Micrurus langsdorffi* Wagler, 1824, p. 10, pl. 2. Type locality: Río Japurá, Amazonas (Brazil). (*Partim*) Schmidt, 1936a, p. 191. (*Partim*) J. A. Peters, 1960, p. 531.
*Elaps imperator* Cope, 1868, p. 110. Type locality: Napo and Marañon, Peru.
*Elaps batesi* Günther, 1868, p. 428, pl. 17-D. Type locality: Pebas, northeastern Peru.
*Micrurus minosus* Amaral, 1935, p. 221, fig. 6. Type locality: Río Putumayo, Colombia.
*Micrurus ornatissimus:* (*nec* Jan) Schmidt, 1955, p. 345.

Distribution: Upper Amazon region of southern Colombia, northwestern Brazil, northern Peru, and adjacent Ecuador.

*Micrurus langsdorffi ornatissimus* (Jan)

*Elaps ornatissimus* Jan, 1858, p. 521. Type locality: Mexico (error).
*Elaps buckleyi* Boulenger, 1896, p. 416, pl. 22-1. Type locality: Canelos, Ecuador, and Pará, Brazil.
*Micrurus ornatissimus:* Schmidt, 1936a, p. 191. J. A. Peters, 1960, p. 532.

Distribution: Amazonian slopes of Andes in eastern Ecuador and northern Peru.

*Micrurus laticollaris laticollaris* (W. Peters)

*Elaps marcgravii* var. *laticollaris* W. Peters, 1869, p. 877. Type locality: Southern Mexico, probably Puebla (restricted to Izúcar de Matamoros, Puebla, Mexico, by Smith and Taylor, 1950).

Distribution: Balsas River basin in Michoacán, Guerrero, Puebla, and Morelos, Mexico.

**Micrurus laticollaris maculirostris,** new subspecies

HOLOTYPE: K.U. No. 32546, a male, collected in spring, 1951.

TYPE LOCALITY: Vicinity of Colima, Colima, Mexico.

PARATYPES: M.V.Z. No. 71355, a male, 16 miles southwest of Colima, Colima, Mexico, collected by Pappenfus and Enedy in 1960. U.M.M.Z. No. 114414, a female, 2.3 miles north-northeast of La Salada, Colima, Mexico, 1300 feet, W. E. Duellman, May 6, 1956. U.M.M.Z. No. 114415, a male, 1.4 miles south-southwest of Los Amoles, Colima, Mexico, 1600 feet, R. E. Ethridge, August 9, 1956. U.M.M.Z. No. 114416, a male, 2.3 miles north of Los Amoles, Colima, Mexico, 1600 feet, R. E. Ethridge, August 10, 1956. F.A.S. No. 15020, a male, 6 miles northeast of Colima, Colima, Mexico, Shannon and Shannon, July 14, 1959. F.A.S. No. 14722, a female, 14.1 miles south of Colima, Colima, Mexico, Shannon and Shannon, July 14, 1960. C.A.S. Nos. 97929, 100176, males, 7 miles southwest of El Rincón, Jalisco, Mexico, 1300 feet, J. A. Dixon, June 14, 1964. A.M.N.H. No. 95067, a male, 3 miles southwest of Pihuamo, Jalisco, Mexico, R. and I. Conant, July 23, 1965.

DIAGNOSIS: Differing from nominate subspecies in having higher subcaudal count in males, 44 to 47 as compared to 40 to 43, and in females, 39 to 41 as compared to 35 to 38. Having light spots on base of first supralabials and rostral, whereas in nominate form these scales usually all black. Black of snout of new subspecies covering all frontal and one-half to three-quarters of parietals, whereas in *M. l. laticollaris* black of snout reduced, covering less than one-half of parietals and, occasionally, even posterior frontal tip light.

DESCRIPTION OF HOLOTYPE: The rostral is wider than high. The internasals are wider than long and are one-half of the length of the prefrontals. The frontal is shorter than its distance from the snout and shorter than the parietals. The latter are as long as their distance from the anterior border of the prefrontals. There are one large anterior and two small posterior temporals. The holotype has 215 ventrals and 46 subcaudals, totaling 261.

The color pattern is in triads. The first triad consists of only two posterior black bands, the anterior black band being absent. The black nuchal band, which is 11 dorsals long, starts two dorsals behind the posterior tips of the parietals and does not reach the seventh supralabial. The snout is dark, with some light spots on the first supralabials and on the snout. The black of the snout covers also the temporals and approximately three-quarters of the parietals. Inferiorly, the head is all light, with weak grayish mottling. There are $\frac{2}{3}$-5-$\frac{2}{3}$ black triads on the

body and three single bands on the tail. The central black band of a triad is two times or less longer than the outer ones but shorter than the red interspaces. Almost all the scales in the red bands have rather irregular black tips, and the black bands are reduced on the ventrals.

The over-all length of the holotype is 615 mm., of the tail, 77 mm. The ratio of tail length to total length is 0.126.

DESCRIPTION OF PARATYPES: The paratypes are similar to the holotype. In some specimens the first few subcaudals are undivided. In most of the specimens the black triads are in a regular pattern, but in the nominate subspecies many specimens show a very irregular triad pattern on the ventrals. Two triads of U.M.M.Z. No. 114416 have fused, forming a quincad. In some specimens the snout is very intensely marked, approaching the light snout condition of *M. d. distans;* in others there are only a few spots on the supralabials.

The male paratypes have from 207 to 212 ventrals, 44 to 47 subcaudals, $\frac{2}{3}$-5-$\frac{2}{3}$ to $\frac{2}{3}$-7-$\frac{2}{3}$ triads on the body and three black bands on the tail. The females have from 219 to 220 ventrals, 39 to 41 subcaudals, $\frac{2}{3}$-5-$\frac{2}{3}$ to $\frac{2}{3}$-6-$\frac{2}{3}$ triads on the body and three black bands on the tail.

NOTES: The Latin name *maculirostris* suggests the light dots on the snout and supralabials.

### *Micrurus latifasciatus* Schmidt

*Micrurus latifasciatus* SCHMIDT, 1933, p. 35. Type locality: Finca El Ciprés, Volcán Zunil, Suchitepequez, Guatemala. SMITH AND TAYLOR, 1945, p. 175. STUART, 1963, p. 127.

DISTRIBUTION: Moderate elevations of the Pacific slopes from southern Chiapas, Mexico, southward to western Guatemala.

### *Micrurus lemniscatus lemniscatus* (Linnaeus)

*Elaps lemniscatus* LINNAEUS, 1758, p. 224. Type locality: Asia (error).
*Micrurus lemniscatus:* BEEBE, 1919, p. 216.

DISTRIBUTION: Northern parts of Guyana, Surinam, and French Guiana.

NOTES: The high number of black triads combined with ventral and subcaudal counts and the general coloration of the Linnaean syntypes conform to the populations of the northern Guianas. The restriction of the type locality to Belém, Pará, Brazil, by Schmidt and Walker (1943) does not correspond to the known distribution of *M. l. lemniscatus* and, therefore, should be considered invalid.

**Micrurus lemniscatus carvalhoi,** new subspecies

Figure 11

HOLOTYPE: U.S.N.M. No. 76341, a male.

TYPE LOCALITY: Catanduva, São Paulo, Brazil.

PARATYPES: U.S.N.M. Nos. 76340, 76343, males, 76342, a female, from Catanduva, São Paulo, Brazil. U.S.N.M. No. 100718, a female, Mariana, Minas Gerais, Brazil. U.S.N.M. No. 39074, a male, Vargem Alegre, Minas Gerais, Brazil. C.N.H.M. No. 37021, a female, Paraná, Brazil. C.N.H.M. No. 37739, a male, São Manõel, São Paulo, Brazil. C.N.H.M. Nos. 37740, a female, 37741, a male, São Paulo, Brazil. C.N.H.M. Nos. 42193, 42194, females, Recife, Pernambuco, Brazil, R. Wenzel. M.C.Z. No. 17852, a male, Vargem Alegre, Minas Gerais, Brazil. M.C.Z. No. 16683, a male, São Paulo, Brazil. M.C.Z. No. 17762, a male, Butantan, Brazil, A. Amaral. A.M.N.H. No. 27344, a female, Brazil, J. B. Viama. A.M.N.H. No. 96999, a male, Barra do Tapirapé, Mato Grosso, Brazil, B. Malkin, July 1–2, 1964. M.N.R. No. 1317, 1318, males, Lagoa Santa, Minas Gerais, Brazil. M.N.R. No. 957, a male, Río Tapirapé, at confluence of Río Araguaia, Mato Grosso, Brazil, A. Leitão de Carvalho. N.M.W. No. 18296, a male, Bahia, Brazil, Corvette Saida, February 3, 1887. N.M.W. Nos. 18640, a female, and 13384:2, a male, Cuyaba (=Cuiabá), Mato Grosso, Brazil, Natterer, 1836. S.M.F. No. 9428c, a male, Ilhéus, Bahia, Koch, 1838. C.A.S. No. 49297, a female, Papery, Rio Grande do Norte, Brazil, H. Heath.

DIAGNOSIS: Related to *M. lemniscatus lemniscatus*, differing in having irregular black spots on red bands, and black spots on white bands, frequently forming interrupted transverse row; also having fewer subcaudals: 29 to 36 in males as against 36 to 40 for *M. l. lemniscatus,* and 27 to 33 in females as against 34 to 39.

DESCRIPTION OF HOLOTYPE: The rostral is almost as high as wide. The prefrontals are almost twice as long as the internasals. The frontal is as long as its distance from the snout, and the parietals are almost as long as their distance from the snout. There are 1+1 temporals. The specimen has 236 ventrals and 32 subcaudals, totaling 268.

The black color of the head covers the anterior three-fourths of the parietals, but there is a light band crossing the prefrontals, postnasals, and part of the preoculars. The mental and first four infralabials are black. A broad red band covers the posterior tips of the parietals and the first four rows of dorsals. There are black spots on the nape. The specimen has $13+1\text{-}\frac{2}{3}$ black triads on the body and tail. The central black band is longer than the outer ones, and the red band is longer

than the central black band of a triad. All the red bands have a few conspicuous black spots; the rest of the scales are immaculate. In cases in which the white bands are longer than one dorsal scale, the scales have large black tips forming a transverse row. On the venter the red and white bands are immaculate. The over-all length of the holotype is 923 mm., 67 mm. of which is the tail length. The ratio of tail length to over-all length is 0.072.

DESCRIPTION OF PARATYPES: The general characteristics of the paratypes are similar to those of the holotype. In some specimens, the light band on the snout is irregular in shape and extends to the frontal, but it is invariably distinct, as in all *M. lemniscatus*. The amount of the black spotting on the red bands varies from only a few spots to 20 or more. Some specimens have both yellow and red scales outlined irregularly in a dark brown or blackish color.

There are from 228 to 254 ventrals in males and 250 to 263 ventrals in females. The number of subcaudals ranges from 29 to 36 in males and from 27 to 33 in females. The males have 10 to 14 black triads on the body, and the females have nine to 16 triads. The largest paratype (U.S.N.M. No. 76342) has an over-all length of 1055 mm., of which the tail comprises 62 mm.

NOTES: This subspecies has been confused in the past with *M. ibiboboca*, *M. lemniscatus lemniscatus*, and even with *M. frontalis*. Comparison of the different populations of the triad type of coral snake in eastern Brazil has shown, however, that they represent several well-differentiated forms. This subspecies is named for Dr. Antenor Leitão de Carvalho, a distinguished Brazilian herpetologist, whose friendly cooperation is well known and appreciated within and outside Brazil.

### *Micrurus lemniscatus diutius* Burger

*Micrurus lemniscatus diutius* BURGER, 1955, p. 8. Type locality: Tunapuna, Trinidad. ROZE, 1955, p. 483. SCHMIDT, 1957, p. 62.

DISTRIBUTION: Trinidad, eastern Venezuela, and central parts of Guyana, Surinam, and French Guiana.

NOTES: It is difficult to determine the exact distribution of this form in the Guianas, because almost all the specimens collected in the past have inadequate locality data.

### *Micrurus lemniscatus frontifasciatus* (Werner)

*Elaps frontifasciatus* WERNER, 1927, p. 250. Type locality: Bolivia.

DISTRIBUTION: Eastern slopes of the Andes in Bolivia.

*Micrurus lemniscatus helleri* Schmidt and Schmidt

*Micrurus helleri* SCHMIDT AND SCHMIDT, 1925, p. 129. Type locality: Pozuzo, Huánuco, Peru.

*Micrurus lemniscatus:* (*partim*) SCHMIDT, 1936a, p. 201. (*Partim*) J. A. PETERS, 1960, p. 531.

DISTRIBUTION: The Amazon region to foothills of Andes from northern Brazil, southern Venezuela, and Colombia to Ecuador, Peru, and Bolivia.

*Micrurus limbatus* Fraser

*Micrurus limbatus* FRASER, 1964, p. 570. Type locality: Southern slope of Volcán San Martín, 7 airline miles north of San Andrés Tuxtla, Veracruz, Mexico.

DISTRIBUTION: Tuxtla region of southern Veracruz, Mexico.

**Micrurus margaritiferus,** new species

Figure 12

HOLOTYPE: A.M.N.H. No. 53362, a female, obtained by H. Bassler in August, 1929.

TYPE LOCALITY: Boca Río Santiago-Río Marañón, Peru.

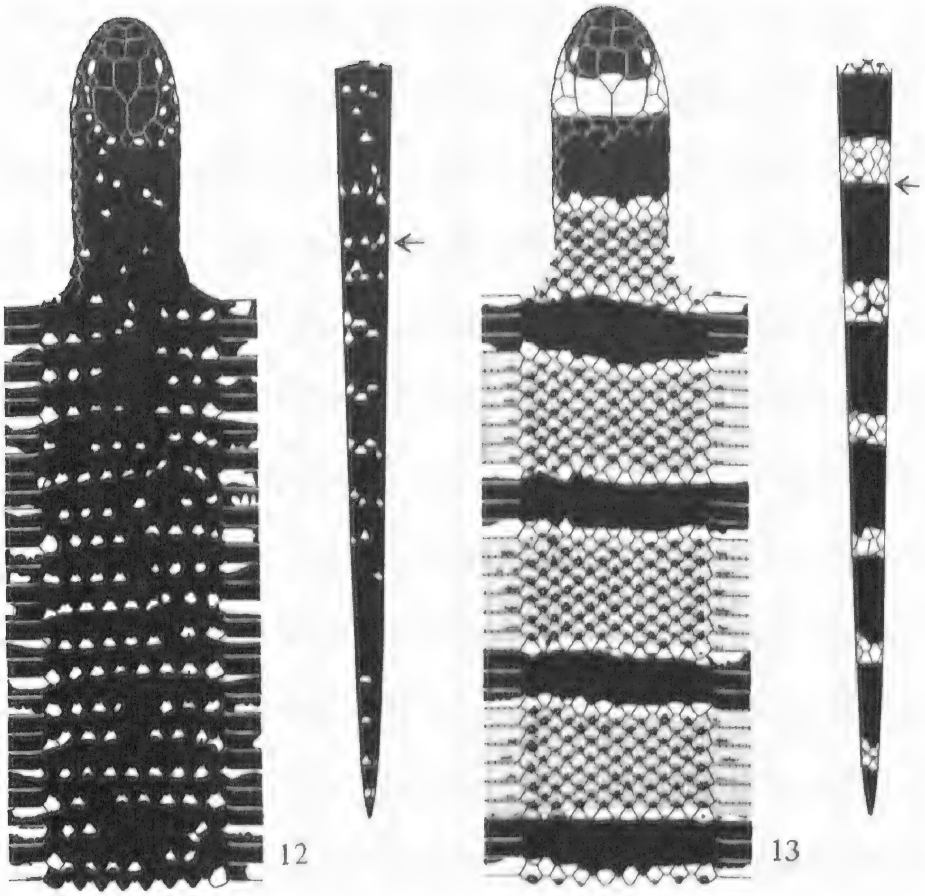
DIAGNOSIS: Black and white coral snake related to *M. albicinctus,* differing in lacking light internasal and prefrontal spots, in having more black bands on body, 141 versus 74 to 90, and more ventrals in females, 225 versus 212 to 216.

DESCRIPTION OF HOLOTYPE: The rostral is wider than high. The prefrontals are only a little longer than the internasals. The frontal is hexagonal, one and a half times longer than its distance from the snout and nearly as long as the parietals. There are 1+1 temporals. The specimen has 225 ventrals and 38 subcaudals, comprising a total of 263.

The type apparently lacked red coloration in life. The body is black, with transverse, white spots that form interrupted rings. The head is also black, with some irregular light spots on several shields. These spots are a little larger on the supralabials and infralabials. The ventral scales are black, with irregular light blotches, less than one scale wide, that correspond approximately to the dorsal light rings. There are 141 black spaces separated by light rings, and 13 more on the tail.

The holotype measures 580 mm. in length, of which the tail is 55 mm. The ratio of tail length to total length is 0.095.

NOTES: Apparently, in this species, as represented by the type, the red bands have been invaded completely by black. It is an extreme situation that somewhat approaches *M. albicinctus, M. annellatus annellatus,* and some of the subspecies of *M. psyches.*




FIGS. 12, 13. Color pattern of *Micrurus*. 12. *Micrurus margaritiferus*, new species (A.M.N.H. No. 53362). 13. *Micrurus nigrocinctus babaspul*, new subspecies (M.C.Z. No. 26961). In life stippled areas are red; white areas, white or yellow; and black areas, black. Arrows indicate the position of the anal plate.

### *Micrurus mertensi* Schmidt

*Micrurus mertensi* SCHMIDT, 1936a, p. 192. Type locality: Pacasmayo, Peru. J. A. PETERS, 1960, p. 531.

DISTRIBUTION: Coastal areas of southwestern Ecuador and northwestern and to central Peru.

### *Micrurus mipartitus mipartitus* (Duméril, Bibron, and Duméril)

*Elaps mipartitus* DUMÉRIL, BIBRON, AND DUMÉRIL, 1854, p. 1220. Type locality: Río Sucio or Senio (=? Sinú), Colombia.

*? Elaps aequicinctus* WERNER, 1903, p. 249. Type locality: Unknown, supposedly Venezuela or Ecuador.

*Micrurus mipartitus mipartitus: (partim)* SCHMIDT, 1955, p. 341.

DISTRIBUTION: From the Darien region in eastern Panama to the Pacific side of Colombia, west of the Andes.

NOTES: The characteristics of the type specimen as well as the locality from which it came suggest that it represents populations of *M. mipartitus* from the Pacific side, and not any of the Andean forms, as previously supposed.

*Micrurus mipartitus anomalus* (Boulenger)

*Elaps anomalus* BOULENGER, 1896, p. 417, pl. 22–2. Type locality: Colombia.
*Micrurus mipartitus:* (*nec* Duméril, Bibron, and Duméril) RUTHVEN, 1922, p. 68.

DISTRIBUTION: Santa Marta Mountains and Cordillera Oriental, east of Magdalena River, Colombia, and Andes in western Venezuela.

*Micrurus mipartitus decussatus* (Duméril, Bibron, and Duméril)

*Elaps decussatus* DUMÉRIL, BIBRON, AND DUMÉRIL, 1854, p. 1221. Type locality: Probably New Granada (=Colombia).

*Elaps fraseri* BOULENGER, 1896, p. 432, pl. 22–3. Type locality: West Ecuador.

*Elaps mentalis* BOULENGER, 1896, p. 432, pl. 22–4. Type locality: Pallatanga, east Ecuador, and Cali, Colombia.

*Elaps calamus* BOULENGER, 1902a, p. 57. Type locality: San Javier, northwestern Ecuador.

*Elaps microps* BOULENGER, 1913, p. 1036, pl. 108–2. Type locality: Peña Lisa, Condoto, Chocó, Colombia.

*Micrurus mipartitus multiscutatus* RENDAHL AND VESTERGREN, 1940, p. 9, fig. 3. Type locality: El Tambo, Cauca, Colombia.

*Micrurus mipartitus mipartitus:* (*partim*) SCHMIDT, 1955, p. 341. J. A. PETERS, 1960, p. 531.

DISTRIBUTION: Western and central Andes, west of Rio Magdalena, and the southern part of the eastern Andes in Colombia, western Ecuador, and, probably, Peru.

*Micrurus mipartitus hertwigi* (Werner)

*Elaps hertwigi* WERNER, 1897, p. 354. Type locality: Central America.
*Micrurus mipartitus multifasciatus:* (*nec* Jan) TAYLOR, 1951, p. 158.

DISTRIBUTION: Atlantic side of Nicaragua, Costa Rica to northwestern Panama.

NOTES: This form has fewer ventrals and subcaudals than *M. m. multifasciatus* from central Panama.

*Micrurus mipartitus multifasciatus* (Jan)

*Elaps multifasciatus* JAN, 1858, p. 521. Type locality: Central America.
*Micrurus mipartitus multifasciatus:* (*partim*) ROZE, 1955, p. 467. SCHMIDT, 1955, p. 340.

DISTRIBUTION: Central Panama, including the Canal Zone.

*Micrurus mipartitus semipartitus* (Jan)

*Elaps semipartitus* JAN, 1858, p. 113. Type locality: Cayenne (restricted to Caracas, Venezuela, by Roze, 1955).

*Micrurus mipartitus semipartitus:* ROZE, 1955, p. 465.

DISTRIBUTION: The Cordillera de la Costa in northern Venezuela.

*Micrurus nigrocinctus nigrocinctus* (Girard)

*Elaps nigrocinctus* GIRARD, 1854, p. 226. Type locality: Taboga Island, Bay of Panama.

*Micrurus nigrocinctus nigrocinctus: (partim)* SCHMIDT, 1933, p. 33.

DISTRIBUTION: The Pacific side of southeastern Costa Rica, Panama, including the Canal Zone to adjacent Colombia.

**Micrurus nigrocinctus babaspul,** new subspecies

Figure 13

HOLOTYPE: A.M.N.H. No. 96996, a male, obtained by Seligmann, Zweifel, Villa, and Roze on January 27, 1966.

TYPE LOCALITY: Little Hill, Great Corn Island (Isla del Maíz Grande), in the Caribbean Sea, about 55 kilometers east-northeast of Bluefields, Nicaragua.

PARATYPES: A.M.N.H. No. 23889, a female, Corn Island, Nicaragua, F. Booth, 1922. M.C.Z. No. 26961, a female, Great Corn Island, Nicaragua, J. A. Peters, 1927.

DIAGNOSIS: Related to *M. nigrocinctus melanocephalus,* differing in having fewer ventral scales in males, 193 against 196 to 206, and, in females, 205 to 209 as against 215 to 224, and in having larger black tips on red scales.

DESCRIPTION OF HOLOTYPE: The rostral is a little wider than high. The internasals are half of the length of the prefrontals. The frontal is shorter than its distance from the snout. The parietals are shorter than their distance from the snout but longer than the frontal. There are 1+2 temporals on the right side and 1+1 temporals on the left side. The holotype has 193 ventrals and 47 subcaudals, totaling 240.

The black extends from the snout to the supraoculars and the anterior half of the frontal, part of the postoculars, and most of the fourth supralabial. Below, the head is light except for the mental and upper part of the first three infralabials which are black, and there are black spots on the chin shields. The black nuchal band is four dorsals long

and covers the tips of the parietals. There are 18 black bands on the body, two to three dorsals long, and seven black bands on the tail, separated by light bands, three scales long, on which there are occasional black spots dorsally. Light bands one-half to one scale long border the black bands on the body. The red bands are six to nine dorsals long, with large, regular, black tips on the red scales.

The over-all length of the holotype is 555 mm., the length of the tail, 80 mm. The ratio of tail length to over-all length is 0.144.

DESCRIPTION OF PARATYPES: The cephalic scutellation of the paratypes is similar to that of the holotype. There are two posterior temporals on A.M.N.H. No. 23889, but only one posterior temporal on M.C.Z. No. 26961. The paratypes have 205 and 209 ventrals, and 35 and 32 subcaudals, respectively. They have 21 and 23 black bands on the body, and five and six black bands on the tail.

NOTES: "Babaspul" is the local name given to this form on the Great Corn Island, where a peculiar dialect is spoken. It represents the phonetic pronunciation of "barber's pole," alluding to the similarity between the red, white, and dark bands on the coral snake and the real "babaspul."

### *Micrurus nigrocinctus coibensis* Schmidt

*Micrurus nigrocinctus coibensis* SCHMIDT, 1936b, p. 208. Type locality: Coiba Island, Panama.

DISTRIBUTION: Coiba Island, Panama.

### *Micrurus nigrocinctus divaricatus* (Hallowell)

*Elaps divaricatus* HALLOWELL, 1855, p. 36. Type locality: Honduras.
*Micrurus nigrocinctus divaricatus:* SCHMIDT, 1933, p. 33.

DISTRIBUTION: Northern and central Honduras to British Honduras.

### *Micrurus nigrocinctus melanocephalus* (Hallowell)

*Elaps melanocephalus* HALLOWELL, 1860, p. 226. Type locality: Ometepec, Nicaragua.
*Micrurus pachecoi* TAYLOR, 1951, p. 165. Type locality: Guanacaste, Costa Rica.

DISTRIBUTION: Pacific side of Nicaragua and southwestern Costa Rica.

### *Micrurus nigrocinctus mosquitensis* Schmidt

*Micrurus nigrocinctus mosquitensis* SCHMIDT, 1933, p. 33. Type locality: Limón, Costa Rica. TAYLOR, 1951, p. 164.

DISTRIBUTION: Atlantic side of eastern and southern Nicaragua through Costa Rica to northwestern Panama.

### *Micrurus nigrocinctus zunilensis* Schmidt

*Micrurus nigrocinctus zunilensis* SCHMIDT, 1932, p. 266. Type locality: Finca El Ciprés, Volcán Zunil, Suchitepequez, Guatemala. SMITH AND TAYLOR, 1945, p. 175. STUART, 1963, p. 127.

*Micrurus nigrocinctus wagneri* MERTENS, 1941, p. 216. Type locality: Finca Germania, Sierra Madre, Chiapas, Mexico, 400–1300 meters.

*Micrurus nigrocinctus ovandoensis* SCHMIDT AND SMITH, 1943, p. 26. Type locality: Salto de Agua, Mt. Ovando, about 15 miles northeast of Escuintla, Chiapas, Mexico. SMITH AND TAYLOR, 1945, p. 175.

DISTRIBUTION: Pacific slopes from Chiapas, Mexico, Guatemala, to El Salvador and southern Honduras.

### *Micrurus nuchalis* Schmidt

*Micrurus nuchalis* SCHMIDT, 1933, p. 35. Type locality: Tapanatepec, Oaxaca, Mexico.

*Micrurus nuchalis nuchalis:* SMITH AND TAYLOR, 1945, p. 176.

DISTRIBUTION: Pacific side of the Isthmus of Tehuantepec, Oaxaca, Mexico.

### *Micrurus peruvianus* Schmidt

*Micrurus peruvianus* SCHMIDT, 1936a, p. 193. Type locality: Perico, Department of Cajamarca, Peru.

DISTRIBUTION: Andes of northeastern Peru.

### *Micrurus proximans* Smith and Chrapliwy

*Micrurus diastema proximans* SMITH AND CHRAPLIWY, 1958, p. 270. Type locality: Four miles north of San Blas, Nayarit, Mexico.

*Micrurus nigrocinctus browni:* ZWEIFEL, 1959, p. 7.

DISTRIBUTION: Nayarit, Mexico.

NOTES: This form is more closely related to *M. browni* than to *M. diastema* as indicated by the presence of supra-anal tubercles in males. However, it exhibits a sexual dimorphism not known in *M. browni*: females have several black body bands incomplete ventrally whereas the bands are all complete in males.

### *Micrurus psyches psyches* (Daudin)

*Vipera psyches* DAUDIN, 1803, p. 320, pl. 100–1. Type locality: Surinam.

*Micrurus psyches:* BEEBE, 1919, p. 216. SCHMIDT, 1936a, p. 190.

DISTRIBUTION: The Guianas, eastern and southern Venezuela, and the extreme southern portion of Colombia.

### *Micrurus psyches circinalis* (Duméril, Bibron, and Duméril)

*Elaps circinalis* DUMÉRIL, BIBRON, AND DUMÉRIL, 1854, p. 1210. Type local-

ity: Martinique (error).

*Elaps riisei* JAN, 1858, p. 525. Type locality: Ile Saint Thomas, Antilles.

*Micrurus psyches riisei:* AMARAL, 1931, p. 89.

*Micrurus circinalis:* SCHMIDT, 1936a, p. 192. ROZE, 1955, p. 471. SCHMIDT, 1957, p. 58.

DISTRIBUTION: Trinidad and adjacent mainland of Venezuela.

**Micrurus psyches medemi,** new subspecies

Figure 14

HOLOTYPE: A.M.N.H. No. 96998, obtained by Nicéforo María in 1950.

TYPE LOCALITY: Villavicencio, Meta, Colombia.

PARATYPES: I.L.S. Nos. 1516, 1517, males, and 1513, 1515, and 1580, females, Villavicencio, Meta, Colombia, Nicéforo María, 1950. I.L.S. No. 1512, a male, Río Ocoa, south of Villavicencio, Colombia, Nicéforo María, February, 1950. C.N.H.M. No. 74371, a male, Río Guatequío, Villavicencio, Colombia, F. Medem, February, 1951. I.B. No. 7208, a male, Villavicencio, Meta, Colombia, Nicéforo María.

DIAGNOSIS: Differing from *M. psyches psyches* in having fewer black bands on body: 15 to 22 in males instead of 22 to 29, and 22 to 25 in females rather than 27 to 41 in *M. p. psyches:* also tending to have more ventrals: 203 to 210 in males, and 211 to 218 in females as against 188 to 195, and 203 to 213, respectively, for *M. p. psyches.*

DESCRIPTION OF HOLOTYPE: The rostral is wider than high; the prefrontals are one and a half times longer than the internasals. The frontal is as long as its distance from the snout, but shorter than the parietals. There are 1+2 temporals. It has 193 ventrals and 45 subcaudals, totaling 238. The head is all black to the posterior tips of the parietals, postoculars, and the fourth supralabial. Below, the mental and the first three infralabials are black, whereas the remainder and the chin shields are light, with some black borders. There are 18+5 black bands on the body and tail, bordered with white bands one scale wide. The black nuchal band is nine dorsals and ventrals long, the rest of the black bands are seven to 11 dorsals long. The interspaces, normally red in other coral snakes, are melanistic, brownish black, five to eight scales long. On the tail there are only black and white bands; the latter are one to two scales wide.

The over-all length of the holotype is 639 mm., of which 99 mm. represents the tail length. The ratio of tail length to over-all length is 0.155.

DESCRIPTION OF PARATYPES: The paratypes are similar to the holo-

type. On most of them the black bands are longer than the red, and in some the bands that are normally red are completely black and thus indistinguishable from those that are normally black. Seven paratypes have 1+1 temporals, and one has 1+2 temporals. There are 193 to 201 ventrals in males and 211 to 218 ventrals in females, and 46 to 49, and 31 to 33, subcaudals in males and females, respectively.

NOTES: This subspecies is dedicated to Dr. Federico Medem, collector of one of the paratypes, in recognition of his valuable contributions to Colombian herpetology.

### *Micrurus putumayensis* Lancini

*Micrurus schmidti* LANCINI, 1962a, p. 1, fig. 1 (preoccupied by *Micrurus schmidti* Dunn, 1940). Type locality: Puerto Socorro, 270 kilometers northeast of Iquitos, Río Putumayo, Departamento de Loreto, Peru.

*Micrurus putumayensis* LANCINI, 1962b, p. 1 (new name for *M. schmidti*).

DISTRIBUTION: Known only from the type locality.

### *Micrurus ruatanus* (Günther)

*Elaps ruatanus* GÜNTHER, 1895, p. 185, pl. 57-B. Type locality: Ruatan (Roatán) Island, Honduras.

*Micrurus ruatanus:* SCHMIDT, 1933, p. 34.

DISTRIBUTION: Roatán Island and the adjacent mainland in Honduras.

### *Micrurus spixii spixii* Wagler

*Micrurus spixii* WAGLER, 1824, p. 48, pl. 18. Type locality: At the Rio Solimões, Brazil.

*Elaps ehrhardti* MÜLLER, 1926, p. 198. Type locality: Manacapurú on the Solimões, Brazil.

*Micrurus spixi spixi:* SCHMIDT, 1953b, p. 175.

DISTRIBUTION: Middle Amazon region of Brazil.

### *Micrurus spixii martiusi* Schmidt

*Micrurus spixi martiusi* SCHMIDT, 1953b, p. 175. Type locality: Santarem, Pará, Brazil.

DISTRIBUTION: Lower Amazon region of Pará and northeastern Mato Grosso, Brazil.

### *Micrurus spixii obscurus* (Jan)

*Elaps corallinus* var. *obscura* JAN, 1872, pl. 6-3. Type locality: Lima (error, designated as Iquitos, Peru, by Schmidt, 1953).

*Elaps heterozonus* W. PETERS, 1881, p. 52. Type locality: Sarayacu, Ecuador.

*Micrurus spixi obscurus:* SCHMIDT, 1953b, p. 175.

DISTRIBUTION: The periphery of the upper Amazon region from southern Colombia and Venezuela to southern Peru.

*Micrurus spixii princeps* (Boulenger)

*Elaps princeps* BOULENGER, 1905, p. 456. Type locality: Province Sara, Santa Cruz de la Sierra, Bolivia.

*Micrurus spixi princeps* SCHMIDT, 1953b, p. 175.

DISTRIBUTION: Northwestern and central Bolivia.

*Micrurus spurrelli* (Boulenger)

*Elaps spurrelli* BOULENGER, 1914, p. 817. Type locality: Penña Lisa, Condoto River, Colombia.

*Micrurus nicefori* SCHMIDT, 1955, p. 346, fig. 65. Type locality: Villavicencio, Cundinamarca, Colombia.

DISTRIBUTION: Western and central Colombia.

NOTES: In describing *M. nicefori*, Schmidt apparently overlooked *E. spurrelli* Boulenger.

*Micrurus steindachneri steindachneri* (Werner)

*Elaps steindachneri* WERNER, 1901, p. 599. Type locality: Ecuador.

*Elaps fasslii* WERNER, 1926, p. 249. Type locality: Colombia.

*Micrurus langsdorffii: (partim)* SCHMIDT, 1936a, p. 191. J. A. PETERS, 1960, p. 531.

DISTRIBUTION: Eastern slopes of the Andes in the Macas-Mendez region, Ecuador.

NOTES: This form differs from *M. langsdorffi* in lacking light spots on the cephalic plates. Probably it is more closely related to *M. psyches* than to *M. langsdorffi*.

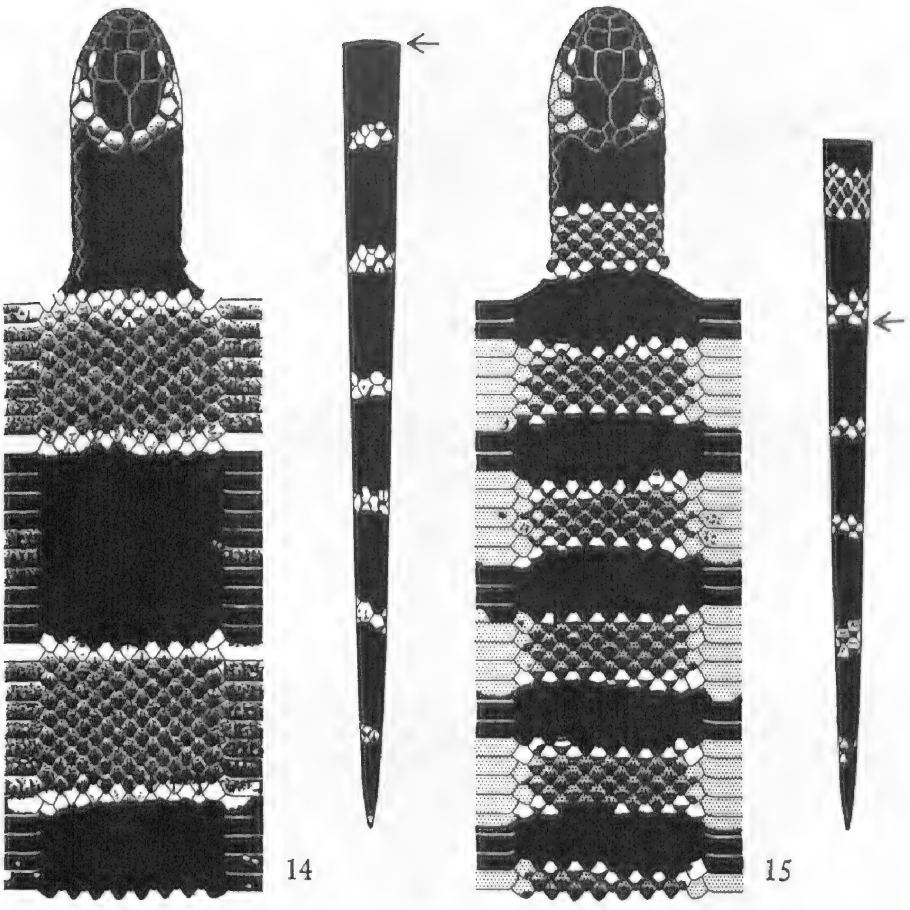
**Micrurus steindachneri orcesi,** new subspecies

Figure 15

HOLOTYPE: U.M.M.Z. No. 88922, a female, obtained by W. Clarke-McIntyre in September, 1937.

TYPE LOCALITY: Meta trail, Baños, Ecuador, 1200 meters.

PARATYPES: U.M.M.Z. Nos. 88924, a male, and 88925, 88926, females, San Francisco, Ecuador, 1200 meters, W. Clarke-McIntyre, between October, 1937, and September, 1938. U.M.M.Z. No. 91566, a male, Abitagua, between Napo and Pastaza rivers, Ecuador, 1200 meters, W. Clarke-McIntyre, August, 1940. U.M.M.Z. No. 88923, female, Baños, Ecuador, 1800 meters, W. Clarke-McIntyre. A.M.N.H. No. 35881, a female, Baños and Canelos, Ecuador, F. Feyer, September, 1920. N.M.W. No. 13383:1, a male, Chimbo (probably Río Chambo, near Baños), Ecuador, Steindachner.




FIGS. 14, 15. Color pattern of *Micrurus*. 14. *Micrurus psyches medemi*, new subspecies (I.B. No. 7208). 15. *Micrurus steindachneri orcesi*, new subspecies (U.M.-M.Z. No. 88922). In life stippled areas are red; white areas, white or yellow; and black areas, black. Arrows indicate the position of the anal plate.

DIAGNOSIS: Differing from *M. steindachneri steindachneri* in having more ventrals in males (214 to 216 versus 200 to 207), fewer subcaudals in females (29 to 33 versus 35 to 36), and fewer black bands on body in females (30 to 37 versus 38 to 42).

DESCRIPTION OF HOLOTYPE: The rostral is wider than high; the prefrontals are approximately twice as long as the internasals. The frontal is slightly longer than its distance from the snout, but shorter than the parietals. There are 1 + 1 temporals. The holotype has 228 ventrals and 30 subcaudals, comprising a total of 258.

The head has a black cap that covers the parietals and fuses with

the nuchal black band. The temporals are light but have large black spots. The first three infralabials are black; the rest are white. There are large black spots on the chin shields. There are 35+5 black bands on the body and tail. The red bands, except for the first one, are melanistic dorsally. The only light bands are yellow, one-half scale long. The black bands are three to four dorsals and two ventrals long. The red bands involve two to three dorsals and three to four ventrals.

The over-all length of the holotype is 860 mm., the tail length, 69 mm. The ratio of the tail length to over-all length is 0.080.

Description of Paratypes: The paratypes are similar to the holotype. The red bands of the Abitagua specimen are less melanistic, although one-half to three-quarters of each scale is black. The black bands of most paratypes are three to four scales long ventrally.

The number of ventrals in males ranges from 214 to 216, in females from 225 to 234. The range of subcaudals in males is from 47 to 49, in females from 29 to 33. The number of black bands on the body in males varies from 24 to 37, and seven to nine on the tail. In females the ranges are 30 to 37 and four to seven. All the black bands on the tail are fused dorsally in U.M.M.Z. No. 88926.

Notes: Apparently this form is distributed in the higher elevations of the upper Río Pastaza Valley, from 1000 to 1800 meters. Río Chambo, the probable source of N.M.W. No. 13383:1, is a tributary of Río Pastaza, joining it near Baños. This subspecies is named for Prof. G. Orcés-V., an active Ecuadorian zoologist, who made available to me his large coral snake collection and provided other valuable assistance.

### **Micrurus steindachneri petersi,** new subspecies

Figure 16

Holotype: U.S.N.M. No. 158295, a female, collected by J. A. Peters on August 1, 1962.

Type Locality: One mile south of Plan de Milagro on the trail to Pan de Azúcar, Morona-Santiago Province, Ecuador, 5600 feet.

Diagnosis: Related to *M. steindachneri orcesi,* differing in having fewer black bands in females (21 versus 30 to 37), longer red bands, averaging six scales long dorsally (two to three dorsals long in *M. s. orcesi*) and in having a light snout. Red coloration reduced, covering only first row of dorsals.

Description of Holotype: The rostral is nearly as high as wide; the prefrontals are two and a half times longer than the internasals. The frontal is a little shorter than its distance from the snout, but shorter

than the parietals. There are 1 + 1 temporals. The type has 232 ventrals and 31 subcaudals, totaling 263.

The snout and the first four supralabials are light bluish gray, followed by a black cap that covers the supraoculars, frontal, and all of the parietals. The nuchal black band is four dorsals long and nearly fused with the black cap. Below, the head is white, except for the first three infralabials which are black. There are 21 black bands on the body, five to six scales long dorsally and two to three scales long ventrally. They are bordered by yellow bands, one and a half scales long. The original red bands are reddish blue, five to seven scales long dorsally.

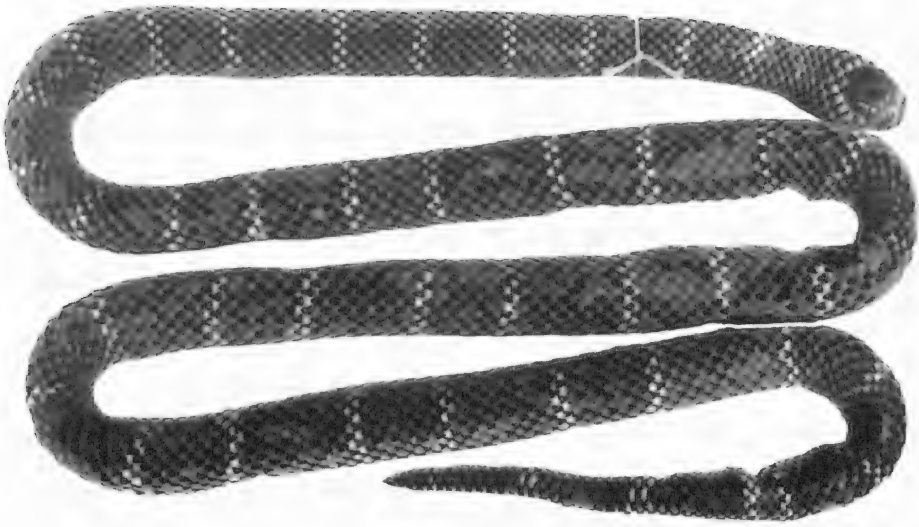


FIG. 16. *Micrurus steindachneri petersi,* new subspecies (U.S.N.M. No. 158295).

Only in the first row of dorsals is the red visible; the ventral scales are all white or yellowish. The four black bands on the tail are much longer that the light bands.

The over-all length of the type is 667 mm., of which the tail is 55 mm. The ratio of the tail length to total length is 0.082.

NOTES: This subspecies may represent an endemic form from the Andean region. It does not inhabit the same mountain chain where *M. s. orcesi* is known, and apparently it lives at much higher elevations than the Macas-Mendez (Río Upano Valley) region inhabited by *M. s. steindachneri.* This subspecies is named for Dr. James A. Peters, collector of the type, in recognition of his important contributions to the understanding of the Ecuadorian herpetofauna.

### *Micrurus stewarti* Barbour and Amaral

*Micrurus stewarti* Barbour and Amaral, 1928, p, 100. Type locality: Sierra de la Bruja, Panama.

*Micrurus schmidti* Dunn, 1940, p. 119, pl. 2. Type locality: Valle de Antón, 50 miles west of the Canal Zone, Panama.

Distribution: Intermediate elevations east and west of the Canal Zone, Panama.

Notes: It is with regret that I synonymize the name that honored the late Dr. Karl P. Schmidt, the best-known authority on coral snakes. Dunn (1940) misinterpreted his new form because of sexual dimorphism and incorrect counts. Moreover, Schmidt, as shown by his notes found after his death, also recognized that both names had been applied to the same form. Its relationship to the *M. nigrocinctus* complex remains to be investigated.

### **Micrurus stuarti,** new species

Figure 17

*Micrurus wagneri:* (*nec* Mertens) Stuart, 1963, p. 127.

Holotype: U.M.M.Z. No. 106708, a male, obtained by L. C. Stuart.

Type Locality: Finca La Paz, San Marcos, Guatemala, 1345 meters.

Paratypes: U.M.M.Z. Nos. 106708 (two specimens), 117187, females, from the same locality and collector as the holotype. U.I. No. 46089, a male, Finca El Naranjo, southwestern slopes of Volcán Santa Clara, Suchitepequez, Guatemala, C. Grant, December, 1958.

Diagnosis: Differing from *M. nigrocinctus zunilensis,* with which it is sympatric, in having more ventrals in both sexes: 210 to 214 in males as against 193 to 206, and 224 to 231 in females (210 to 219 for *M. n. zunilensis*), and in having scales in red bands with large black tips, and occasional larger black spots; latter characteristic also distinguishing new species from *M. browni.*

Description of Holotype: The rostral is wider than high; the prefrontals are almost twice as long as the internasals. The frontal is as long as its distance from the snout, but shorter than the parietals. There are 1+2 temporals. The holotype has 215 ventrals and 48 subcaudals, totaling 263. The supra-anal tubercles are poorly developed.

The black color of the snout extends irregularly to the posterior border of the supraoculars and three-fourths of the frontal. The light parietal band is dark brown. Ventrally, almost all the head scales are black. There are 13+4 black bands on the body and tail; the fourth is incomplete on the right side. The nuchal black band projects over the posterior tips of

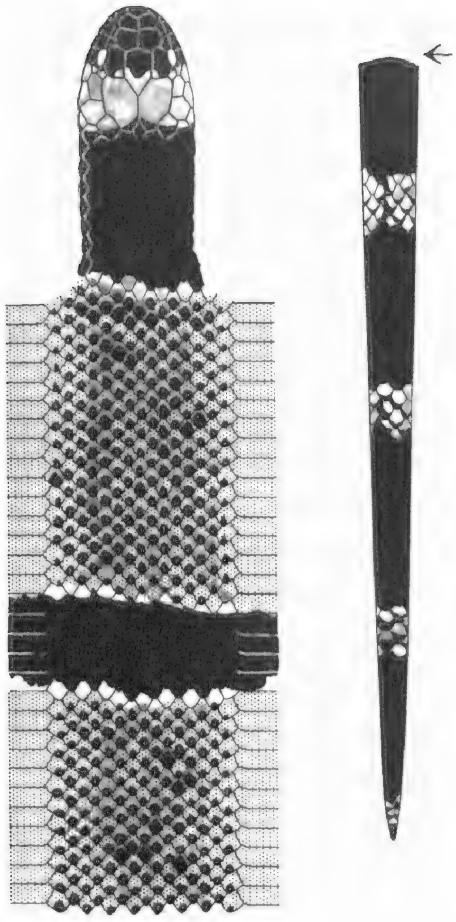


FIG. 17. Color pattern of *Micrurus stuarti,* new species (U.M.M.Z. No. 106708). In life stippled areas are red; white areas, white or yellow; and black areas, black. Arrow indicates the position of the anal plate.

the parietals. The black bands are four dorsals and three to four ventrals long, bordered by poorly developed yellow rings, about one scale long. The red scales have large irregular black tips, with some larger spots between them. Ventrally, the red bands are virtually immaculate. The black bands on the tail are more than twice as wide as the light ones, and the light areas have large irregular black spots. In general all the lighter bands are dark brownish.

The over-all length of the holotype is 593 mm., tail length, 85 mm. The ratio of tail length to over-all length is 0.143.

DESCRIPTION OF PARATYPES: The general characteristics of the paratypes agree with those of the holotype. There is less spotting on the

light tail bands, but all the specimens have the throat heavily spotted with black. The male has 210 ventrals, 45 subcaudals and 14+4 black bands on the body and tail. The female paratypes have from 224 to 231 ventrals, 37 to 39 subcaudals, and 16 to 19 black body bands, with three to four bands on the tail.

NOTES: The high number of ventrals suggests that this species is related to *M. browni,* but the large black tips on the red scales are quite unusual for that group. This species is dedicated to Dr. Laurence C. Stuart of the University of Michigan, whose deep affection for Guatemala is well known and appreciated. His contributions to the natural history of that country are among the best for any Latin American country.

*Micrurus surinamensis surinamensis* (Cuvier)

*Elaps surinamensis* CUVIER, 1817, p. 84. Type locality: Surinam.
*Micrurus surinamensis surinamensis:* SCHMIDT, 1952, p. 29; 1955, p. 349. J. A. PETERS, 1960, p. 532.

DISTRIBUTION: The Guianas and the Amazonian region, including Colombia, Ecuador, Peru, Brazil, and Bolivia.

*Micrurus surinamensis nattereri* Schmidt

*Micrurus surinamensis nattereri* SCHMIDT, 1952, p. 27. Type locality: Between Guaramoca and San Fernando, Venezuela. ROZE, 1955, p. 492.

DISTRIBUTION: Upper Orinoco and Rio Negro region in southern Venezuela and northern Brazil.

*Micrurus tschudii tschudii* (Jan)

*Elaps tschudii* JAN, 1858, p. 524. Type locality: Peru.
*Micrurus tschudii tschudii:* SCHMIDT, 1936a, p. 202.

DISTRIBUTION: Pacific coast of Peru from the Departamento de Libertad, probably to northwestern Bolivia.

*Micrurus tschudii olssoni* Schmidt and Schmidt

*Micrurus olssoni* SCHMIDT AND SCHMIDT, 1925, p. 130, pl. 11. Type locality: Negritos, Piura, Peru.
*Micrurus tschudii olssoni:* SCHMIDT, 1936a, p. 202.

DISTRIBUTION: Pacific side of southern Ecuador to northwestern Peru.
NOTES: This form intergrades with *M. t. tschudii* in Cajamarca, Peru.

## FAUNAL LISTS

The following faunal lists cover all the major political or geographical

divisions where coral snakes have been found. Central America includes all the countries from Guatemala to Panama, and the islands from that region. The Guianas, as conceived here, include Guyana, Surinam, and French Guiana.

### United States (Three)

*Micruroides euryxanthus euryxanthus*
*Micrurus fulvius fulvius*
*Micrurus fulvius tenere*

### Mexico (Thirty-one)

*Micruroides euryxanthus euryxanthus*
*Micruroides euryxanthus australis*
*Micruroides euryxanthus neglectus*
*Micrurus bernardi*
*Micrurus bogerti*
*Micrurus browni browni*
*Micrurus browni taylori*
*Micrurus diastema diastema*
*Micrurus diastema affinis*
*Micrurus diastema alienus*
*Micrurus diastema apiatus*
*Micrurus diastema macdougalli*
*Micrurus diastema sapperi*
*Micrurus distans distans*
*Micrurus distans michoacanensis*
*Micrurus distans oliveri*
*Micrurus distans zweifeli*
*Micrurus elegans elegans*
*Micrurus elegans veraepacis*
*Micrurus ephippifer*
*Micrurus fitzingeri*
*Micrurus fulvius maculatus*
*Micrurus fulvius microgalbineus*
*Micrurus fulvius tenere*
*Micrurus laticollaris laticollaris*
*Micrurus laticollaris maculirostris*
*Micrurus latifasciatus*
*Micrurus limbatus*
*Micrurus nigrocinctus zunilensis*
*Micrurus nuchalis*
*Micrurus proximans*

### Central America (Twenty-six)

*Micrurus alleni alleni*
*Micrurus alleni yatesi*
*Micrurus ancoralis jani*

*Micrurus browni browni*
*Micrurus browni importunus*
*Micrurus clarki*
*Micrurus diastema aglaeope*
*Micrurus diastema apiatus*
*Micrurus diastema sapperi*
*Micrurus dissoleucus dunni*
*Micrurus elegans veraepacis*
*Micrurus hippocrepis*
*Micrurus latifasciatus*
*Micrurus mipartitus mipartitus*
*Micrurus mipartitus hertwigi*
*Micrurus mipartitus multifasciatus*
*Micrurus nigrocinctus nigrocinctus*
*Micrurus nigrocinctus babaspul*
*Micrurus nigrocinctus coibensis*
*Micrurus nigrocinctus divaricatus*
*Micrurus nigrocinctus melanocephalus*
*Micrurus nigrocinctus mosquitensis*
*Micrurus nigrocinctus zunilensis*
*Micrurus ruatanus*
*Micrurus stewarti*
*Micrurus stuarti*

## Colombia (Twenty-eight)

*Leptomicrurus narduccii*
*Micrurus ancoralis jani*
*Micrurus bocourti sangilensis*
*Micrurus carinicauda carinicauda*
*Micrurus carinicauda antioquiensis*
*Micrurus carinicauda colombianus*
*Micrurus carinicauda dumerilii*
*Micrurus carinicauda transandinus*
*Micrurus clarki*
*Micrurus dissoleucus dissoleucus*
*Micrurus dissoleucus melanogenys*
*Micrurus dissoleucus nigrirostris*
*Micrurus filiformis filiformis*
*Micrurus filiformis subtilis*
*Micrurus hemprichii hemprichii*
*Micrurus hemprichii ortoni*
*Micrurus isozonus*
*Micrurus langsdorffi langsdorffi*
*Micrurus lemniscatus helleri*
*Micrurus mipartitus mipartitus*
*Micrurus mipartitus anomalus*
*Micrurus mipartitus decussatus*
*Micrurus nigrocinctus nigrocinctus*
*Micrurus psyches psyches*

*Micrurus psyches medemi*
*Micrurus spixii obscurus*
*Micrurus spurrelli*
*Micrurus surinamensis surinamensis*

VENEZUELA (THIRTEEN)

*Leptomicrurus collaris*
*Micrurus carinicauda carinicauda*
*Micrurus dissoleucus dissoleucus*
*Micrurus hemprichii hemprichii*
*Micrurus isozonus*
*Micrurus lemniscatus diutius*
*Micrurus lemniscatus helleri*
*Micrurus mipartitus anomalus*
*Micrurus mipartitus semipartitus*
*Micrurus psyches psyches*
*Micrurus psyches circinalis*
*Micrurus spixii obscurus*
*Micrurus surinamensis nattereri*

THE GUIANAS (SEVEN)

*Leptomicrurus collaris*
*Micrurus averyi*
*Micrurus hemprichii hemprichii*
*Micrurus lemniscatus lemniscatus*
*Micrurus lemniscatus diutius*
*Micrurus psyches psyches*
*Micrurus surinamensis surinamensis*

ECUADOR (SEVENTEEN)

*Leptomicrurus narduccii*
*Micrurus ancoralis ancoralis*
*Micrurus annellatus annellatus*
*Micrurus bocourti bocourti*
*Micrurus carinicauda transandinus*
*Micrurus hemprichii ortoni*
*Micrurus langsdorffi langsdorffi*
*Micrurus langsdorffi ornatissimus*
*Micrurus lemniscatus helleri*
*Micrurus mertensi*
*Micrurus mipartitus decussatus*
*Micrurus spixii obscurus*
*Micrurus steindachneri steindachneri*
*Micrurus steindachneri orcesi*
*Micrurus steindachneri petersi*
*Micrurus surinamensis surinamensis*
*Micrurus tschudii olssoni*

### Peru (Seventeen)

*Leptomicrurus narduccii*
*Micrurus annellatus annellatus*
*Micrurus annellatus montanus*
*Micrurus filiformis filiformis*
*Micrurus hemprichii ortoni*
*Micrurus langsdorffi langsdorffi*
*Micrurus langsdorffi ornatissimus*
*Micrurus lemniscatus helleri*
*Micrurus margaritiferus*
*Micrurus mertensi*
*Micrurus mipartitus decussatus*
*Micrurus peruvianus*
*Micrurus putumayensis*
*Micrurus spixii obscurus*
*Micrurus surinamensis surinamensis*
*Micrurus tschudii tschudii*
*Micrurus tschudii olssoni*

### Brazil (Twenty)

*Leptomicrurus narduccii*
*Leptomicrurus schmidti*
*Micrurus albicinctus*
*Micrurus corallinus*
*Micrurus decoratus*
*Micrurus filiformis filiformis*
*Micrurus filiformis subtilis*
*Micrurus frontalis frontalis*
*Micrurus frontalis altirostris*
*Micrurus frontalis brasiliensis*
*Micrurus frontalis pyrrhocryptus*
*Micrurus hemprichii ortoni*
*Micrurus ibiboboca*
*Micrurus langsdorffi langsdorffi*
*Micrurus lemniscatus carvalhoi*
*Micrurus lemniscatus helleri*
*Micrurus spixii spixii*
*Micrurus spixii martiusi*
*Micrurus surinamensis surinamensis*
*Micrurus surinamensis nattereri*

### Bolivia (Ten)

*Leptomicrurus narduccii*
*Micrurus annellatus balzani*
*Micrurus annellatus bolivianus*
*Micrurus annellatus montanus*
*Micrurus frontalis pyrrhocryptus*

*Micrurus lemniscatus frontifasciatus*
*Micrurus lemniscatus helleri*
*Micrurus spixii princeps*
*Micrurus surinamensis surinamensis*
*Micrurus tschudii tschudii*

PARAGUAY (TWO)

*Micrurus frontalis frontalis*
*Micrurus frontalis pyrrhocryptus*

URUGUAY (TWO)

*Micrurus corallinus*
*Micrurus frontalis altirostris*

ARGENTINA (FOUR)

*Micrurus corallinus*
*Micrurus frontalis frontalis*
*Micrurus frontalis altirostris*
*Micrurus frontalis pyrrhocryptus*

## BIBLIOGRAPHY

AHL, E.
1927. Zwei neue Korallenotter der Gattung *Elaps*. Zool. Anz., vol. 70, no. 9/10, pp. 251–252.

AMARAL, A.
1921. Contribucão para o conhecimento dos ofídios do Brasil. Parte 1. Quatro novas especies de serpentes brasileiras. Anex. Mem. Inst. Butantan, Seccão Ofiologia, vol. 1, fasc. 1, pp. 1–88, pls. 1–17.
1925a. South American snakes in the collection of the United States National Museum. Proc. U. S. Natl. Mus., vol. 67, art. 24, pp. 1–30.
1925b. Da invalidez de especie de Colubrideo Elapineo Micrurus ibiboboca (*Merrem*) e redescripçao de *M. lemniscatus* (L.) Rev. Mus. Paulista, vol. 15, pp. 29–40.
1926a. Nota de ophiologia. Sobre a invalidez de um genero e algumas especies de ophidios sul-americanos. *Ibid.,* vol. 14, pp. 17–33.
1926b. Ophidios de Mato Grosso. Comm. Linh. Telegr. Mato Grosso ao Amazonas, publ. 84, annex no. 5, pp. 1–29, figs. 1–10.
1931. Studies of neotropical Ophidia. XXIII. Additional note on Colombian snakes. Bull. Antivenin Inst. Amer., vol. 4, pp. 85–89.
1935. Estudos sobre ophidos neotropicos. XXXIII. Novas especies de ophidios da Colombia. Mem. Inst. Butantan, vol. 9, pp. 219–223, figs. 1–8.
1944. Notas sobre a ofiologia neotropica e Brasílica. XI. Subespecies de Micrurus lemniscatus (L.) e suas afinidades com M. frontalis (Dm. Bibron). Papéis Avulsos, Dept. Zool., Saõ Paulo, vol. 5, no. 11, pp. 83–94.

Baird, S. F., and C. Girard
1853. Catalogue of North American reptiles in the Museum of the Smithsonian Institution. Part 1. Serpents. Washington, xvi + 172 pp.

Barbour, T.
1923. Notes on the reptiles and amphibians from Panama. Occas. Papers Mus. Zool. Univ. Michigan, no. 129, pp. 1–16.

Barbour, T., and A. Amaral
1928. A new elapid from western Panama. Bull. Antivenin Inst. Amer., vol. 1, p. 100.

Beebe, W.
1919. The higher vertebrates of British Guiana. List of Amphibia, Reptilia and Mammalia. Zoologica, vol. 2, no. 7, pp. 205–216.

Boulenger, G. A.
1896. Catalogue of the snakes in the British Museum. London, vol. 3, xii + 727 pp., 25 pls.
1898a. A list of the reptiles and batrachians collected by the late Prof. L. Balzan in Bolivia. Ann. Mus. Stor. Nat. Genova, ser. 2, vol. 19, pp. 128–133.
1898b. An account of the reptiles and batrachians collected by Mr. W. F. H. Rosenberg in western Ecuador. Proc. Zool. Soc. London, pp. 107–127, pls. 10–18.
1902a. Descriptions of new batrachians and reptiles from north-western Ecuador. Ann. Mag. Nat. Hist., ser. 7, vol. 9, pp. 51–57.
1902b. List of fishes, batrachians, and reptiles collected by the late Mr. P. O. Simons in the provinces of Mendoza and Cordova, Argentina. *Ibid.,* ser. 7, vol. 9, pp. 336–339.
1902c. Descriptions of new batrachians and reptiles from the Andes of Peru and Bolivia. *Ibid.,* ser. 7, vol. 10, pp. 394–402.
1905. Descriptions of new snakes in the collection of the British Museum. *Ibid.,* ser. 7, vol. 15, pp. 453–456.
1913. On a collection of batrachians and reptiles made by Dr. H. G. F. Spurell, F.Z.S., in the Choco, Colombia. Proc. Zool. Soc. London, pp. 1019–1038, pls. 102–108.
1914. On a second collection of batrachians and reptiles made by Dr. H. G. F. Spurell, F.Z.S., in the Choco, Colombia. *Ibid.,* pp. 813–817, pls. 1–2.
1920. Descriptions of four new snakes in the collection of the British Museum. Ann. Mag. Nat. Hist., ser. 9, vol. 6, pp. 108–111.

Brown, B. C., and H. M. Smith
1942. A new subspecies of Mexican coral snake. Proc. Biol. Soc. Washington, vol. 55, pp. 63–66.

Burger, W. L.
1955. A new subspecies of the coral snake, *Micrurus lemniscatus,* from Venezuela, British Guiana, and Trinidad; and a key for the identification of associated species of coral snakes. Bol. Mus. Cien. Nat., Caracas, vol. 1, no. 2, pp. 1–19.

Cope, E. D.
1859. Catalogue of the venomous serpents in the museum of the Academy of Natural Sciences of Philadelphia, with notes on the families,

genera and species. Proc. Acad. Nat. Sci. Philadelphia, vol. 11, pp. 332–347.

1860. Supplement to "A catalogue of the venomous serpents in the museum of the Academy, etc." *Ibid.,* vol. 12, pp. 72–74.

1862. Catalogue of the reptiles obtained during the explorations of the Parana, Paraguay, Vermejo and Uruguay rivers, by Capt. Thos. J. Page, U.S.N.; and of those procured by Lieut. N. Michler, U.S. Top. Eng., Commander of the expedition conducting the survey of the Atrato River. *Ibid.,* vol. 14, pp. 346–359.

1868. An examination of the Reptilia and Batrachia obtained by the Orton expedition to Equador and the Upper Amazon, with notes on other species. *Ibid.,* vol. 20, pp. 94–140.

1869. Seventh contribution to the herpetology of tropical America. Proc. Amer. Phil. Soc., vol. 11, pp. 147–169, pls. 9–11.

1886. Thirteenth contribution to the herpetology of tropical America. *Ibid.,* vol. 23, pp. 271–287.

1887. Catalogue of batrachians and reptiles of Central America and Mexico. Bull. U. S. Natl. Mus., no. 32, pp. 1–98.

CUVIER, G. L. C. F. D.

1817. Le règne animal. Paris, vol. 2, pp. i–xviii, 1–532.

DAUDIN, F. M.

1803. Histoire naturelle des reptiles. Paris, vol. 8, pp. 1–439, pls. 93–100.

DUELLMAN, W. E.

1957. Notes on snakes from the Mexican state of Sinaloa. Herpetologica, vol. 13, no. 3, pp. 237–240.

DUGÈS, A.

1891. *Elaps Diastema,* var. *Michoacanensis.* La Naturaleza, Mexico, vol. 1, ser. 2, p. 487, pl. 32.

DUMÉRIL, A. M. C., G. BIBRON, AND A. H. A. DUMÉRIL

1854. Erpétologie générale. Paris, Librairie Encyclopedique de Roret, vol. 7, 1536 pp.

DUNN, E. R.

1940. New and noteworthy herpetological material from Panama. Proc. Acad. Nat. Sci. Philadelphia, vol. 92, pp. 105–122, pl. 2.

1942. New or noteworthy snakes from Panama. Notulae Nat., Philadelphia, no. 108, pp. 1–8.

FRASER, D. F.

1964. *Micrurus limbatus,* a new coral snake from Veracruz, Mexico. Copeia, no. 3, pp. 570–573, figs. 1–3, tables 1–3.

GIRARD, C.

1854. Abstract of a report to Lieut. James M. Gilliss, U.S.N., upon the reptiles collected during the U.S.N. astronomical expedition to Chili. Proc. Acad. Nat. Sci. Philadelphia, vol. 7, pp. 226–227.

GRIFFIN, L. E.

1916. A catalogue of the Ophidia from South America at present (June, 1916) contained in the Carnegie Museum with descriptions of some new species. Mem. Carnegie Mus., for 1915, vol. 7, no. 3, pp. 163–228, pl. 28.

GÜNTHER, A.
1859. On the genus *Elaps* Wagler. Proc. Zool. Soc. London, pp. 79–89, pls. 16–18.
1868. Sixth account of new species of snakes in the collection of the British Museum. Ann. Mag. Nat. Hist., ser. 4, vol. 1, pp. 413–429, pls. 17–19.
1895. Biologia Centrali-Americana. Reptilia and Batrachia. London, xx + 326 pp., 76 pls.

HALLOWELL, E.
1855. Contributions to South American herpetology. Jour. Acad. Nat. Sci. Philadelphia, ser. 2, vol. 3, pp. 33–36.
1860. Report of the Reptilia of the north Pacific exploring expedition, under command of Capt. John Rogers, U.S.N. Proc. Acad. Nat. Sci. Philadelphia, vol. 12, pp. 480–510.

HOGE, A. R.
1956. Uma nova espécie de *Micrurus (Serp. Elap.)* do Brasil. Mem. Inst. Butantan, vol. 27, pp. 67–72, figs. 1–5, 1 table.

HOGE, A. R., AND A. R. W. D. L. ROMANO
1966. Leptomicrurus in Brasil (Serpentes-Elapidae). Mem. Inst. Butantan, vol. 32, 1965, pp. 1–8, figs. 1–3.

JAN, G.
1858. Plan d'une iconographie descriptive des ophidiens et description sommaire de nouvelles espèces de serpents. Rev. Mag. Zool., ser. 2, vol. 10, pp. 438–449, 514–527.
1863a. Elenco sistematico degli ofidi descritti e disegnati per l'iconografia generale. Milan, pp. i–viii, 9–143.
1863b. Enumerazione sistematica degli ofidi appartenenti al gruppo *Coronellidae.* Arch. Zool. Anat. Fisiol., vol. 21, pt. 2, pp. 213–330.
1872. *In* Jan, G., and F. Sordelli, Iconographie générale des ophidiens. Milan, vol. 3.

KENNICOTT, R.
1860. Descriptions of new species of North American serpents in the museum of the Smithsonian Institution, Washington. Proc. Acad. Nat. Sci. Philadelphia, vol. 12, pp. 328–338.

LANCINI, A. R.
1962a. Una nueva especie de serpiente coral *(Serpentes: Elapidae)* del Peru. Publ. Ocas. Mus. Cien. Nat., Caracas, zool., no. 2, pp. 1–3, 1 fig.
1962b. Un cambio de nombre para una serpiente coral *(Elapidae: Micrurus)* del Peru. *Ibid.*, no. 3, 1 p.

LINNAEUS, C.
1758. Systema naturae. Editio decima, reformata. Stockholm, vol. 1, 823 pp.
1766–1767. Systema naturae. Editio duodecima. Classis III Amphibia. Stockholm, pp. 347–393.

LUTZ, A., AND O. DE MELLO
1922. *Elaps ezequieli* e *Rhinostoma bimaculatum*, cobras novas do estado de Minas Geraes. Mem. Inst. Oswaldo Cruz, vol. 15, 138–142 (English), 235–239 (Portuguese), pl. 31.

MEISE, W.
1938. Eine neue Korallenschlange aus dem Amazonasgebiet. Zool. Anz.,

vol. 123, no. 1/2, pp. 20–22.

MERREM, B.
1820. Versuch eines Systems der Amphibien. Marburg, pp. i–xv, 1–191, 1 fig.

MERTENS, R.
1941. Eine neue Korallennatter aus Mexiko. Senckenbergiana, vol. 23, no. 4–6, pp. 216–217, 1 fig.

MOCQUARD, F.
1887. Sur une nouvelle espèce d'*Elaps, E. heterochilus.* Bull. Soc. Philom., Paris, ser. 7, vol. 11, pp. 39–41.

MÜLLER, L.
1926. Neue Reptilien und Batrachier der zoologischen Sammlung des bayerischen Staates. Zool. Anz., vol. 7/8, pp. 192–200.

NICÉFORO MARÍA, HERMANO
1942. Los ofidios de Colombia. Rev. Acad. Colombiana Cien. Exact. Fis. Nat., vol. 5, no. 17, pp. 84–101, pls. 1–3.

PETERS, J. A.
1960. The snakes of Ecuador. Bull. Mus. Comp. Zool., Harvard, vol. 122, no. 9, pp. 491–541.

PETERS, W.
1862. Über neue Schlangen des königl. zoologischen Museums: *Typhlops striolatus. Geophidium dubium, Streptophorus (Ninia) maculatus, Elaps hippocrepis.* Monatsber. Akad. Wiss., Berlin, for 1861, pp. 922–925.
1869. Über mexicanische Amphibien, welche Hr. Berkenbusch in Puebla auf Veranlassung des Hrn. Legationsrath von Schölzer dem zoologischen Museum zugesandt hat. *Ibid.,* pp. 874–881.
1871. Über eine von Hrn. Robert Abendroth in dem Hochlande von Peru gemachte Sammlung von Amphibien, welche derselbe dem königl. zoologischen Museum geschenkt hat. *Ibid.*, pp. 397–404.
1881. Über das Vorkommen schildförmiger Verbreiterungen der Dornfortsätze bei Schlangen und über neue oder weniger bekannte Arten dieser Abtheilung der Reptilien. Sitzungsber. Ges. Naturf. Freunde, Berlin, pp. 49–52.

RENDAHL, H., AND G. VESTERGREN
1940. Notes on Colombian snakes. Arkiv f. Zool., vol. 33A, no. 1, pp. 1–16, 4 figs.

ROZE, J. A.
1955. Revisión de las corales *(Serpentes: Elapidae)* de Venezuela. Acta Biol. Venezuelica, Caracas, vol. 1, no. 17, pp. 453–500, 3 figs., 2 color pls.

RUTHVEN, A. G.
1922. The amphibians and reptiles of the Sierra Nevada de Santa Marta, Colombia. Misc. Publ. Univ. Michigan Mus. Zool., no. 8, pp. 1–69, pls. 1–12.

SCHLEGEL, H.
1837. Essai sur la physiognomie des serpents. The Hague, pt. 1, 606 pp.

SCHMIDT, K. P.
1928. Notes on American coral snakes. Bull. Antivenin Inst. Amer., vol. 2, no. 3, pp. 63–64.

1932. A new subspecies of coral snake from Guatemala. Proc. California Acad. Sci., ser. 4, vol. 20, no. 7, pp. 265–267.
1933. Preliminary account of the coral snakes of Central America and Mexico. Field Mus. Nat. Hist., zool. ser., vol. 20, pp. 29–40.
1936a. Preliminary account of coral snakes of South America. *Ibid.,* vol. 20, no. 19, pp. 189–203.
1936b. Notes on Central American and Mexican coral snakes. *Ibid.*, vol. 20, no. 20, pp. 205–216, 4 figs.
1937. The history of *Elaps collaris* Schlegel, 1837–1937. *Ibid.,* vol. 20, no. 27, pp. 361–364.
1939. A new coral snake from British Guiana. *Ibid.*, vol. 24, no. 6, pp. 45–47, fig. 5.
1952. The Surinam coral snake, *Micrurus surinamensis.* Fieldiana, zool., vol. 34, no. 4, pp. 25–34, figs. 4–6.
1953a. Hemprich's coral snake, *Micrurus hemprichi. Ibid.*, vol. 34, no. 13, pp. 165–170, figs. 31–32.
1953b. The Amazonian coral snake, *Micrurus spixi. Ibid.*, vol. 34, no. 14, pp. 171–180, figs. 33–35.
1954. The annellated coral snake, *Micrurus annellatus* Peters. *Ibid.*, vol. 34, no. 30, pp. 319–325, figs. 63–64.
1955. Coral snakes of the genus *Micrurus* in Colombia. *Ibid.*, vol. 34, no. 34, pp. 337–359, figs. 65–69.
1957. The venomous coral snakes of Trinidad. *Ibid.*, vol. 39, no. 8, pp. 55–63, figs. 7–9.

Schmidt, K. P., and F. J. W. Schmidt
1925. New coral snakes from Peru. Reports on results of the Captain Marshall Field Expeditions. Publ. Field Mus. Nat. Hist., zool. ser., vol. 12, no. 10, pp. 129–134, pls. 11–12.

Schmidt, K. P., and H. M. Smith
1943. Notes on coral snakes from Mexico. Publ. Field Mus. Nat. Hist., zool. ser., vol. 29, no. 2, pp. 25–31.

Schmidt, K. P., and W. F. Walker
1943. Peruvian snakes from the University of Arequipa. Field Mus. Nat. Hist., zool. ser., vol. 24, no. 26, pp. 279–296.

Shreve, B.
1953. Notes on the races of *Micrurus frontalis* (Duméril, Duméril and Bibron). Breviora, no. 16, pp. 1–6.

Smith, H. M.
1947. Notas sobre una colección de reptiles y anfibios de Chiapas, Mex. Rev. Soc. Mexicana Hist. Nat., vol. 7, nos. 1/4, for 1946, pp. 63–74.

Smith, H. M., and P. S. Chrapliwy
1958. New and noteworthy Mexican herptiles from the Lidicker collection. Herpetologica, vol. 13, no. 4, pp. 267–271.

Smith, H. M., and E. H. Taylor
1945. An annotated checklist and key to the snakes of Mexico. Bull. U. S. Natl. Mus., no. 187, pp. i–iv, 1–239.

Stuart, L. C.
1963. A checklist of the herpetofauna of Guatemala. Misc. Publ. Mus. Zool. Univ. Michigan, no. 122, pp. 1–150, 1 frontispiece, 1 map.

TAYLOR, E. H.
1951. A brief review of the snakes of Costa Rica. Univ. Kansas Sci. Bull., vol. 34, no. 1, pp. 3–188, figs. 1–7, pls. 1–23.

WAGLER, J.
1824. Serpentum Brasiliensium species novae. *In* Spix, J. de, Animalia nova sive species novae. Monaco, viii + 75 pp., 26 pls.

WERNER, F.
1897. Über einige neue oder seltene Reptilien und Frösche der zoologischen Sammlung des Staates in München. Sitzber. Akad. Wiss., Munich, vol. 27, pp. 203–220.
1901. Über Reptilien und Batrachier aus Ecuador und Neu-Guinea. Verhandl. Zool. Bot. Gesell., Vienna, vol. 51, pp. 593–614, 5 pls.
1903. Neue Reptilien und Batrachier aus dem naturhistorischen Museum in Brüssel. Zool. Anz., vol. 26, no. 693, pp. 246–253.
1904. Über Reptilien und Batrachier aus Guatemala und China in der zoologischen Staats-Sammlung in München, nebst einem Anhang über seltene Formen aus anderen Gegenden. Abhandl. Bayerische Akad. Wiss., vol. 22, no. 2, pp. 343–384, figs. 1–4, 1 pl.
1927. Neue oder wenig bekannte Schlangen aus dem Wiener naturhistorischen Staatsmuseum. (III Teil). Sitzber. Akad. Wiss., Vienna, abt. 1, vol. 135, pp. 243–257.

WIED, MAXIMILIAN NEUWIED
1820. Über die Cobra Coral oder Cobras Coraes der Brasilianer. Nova Acta Acad. Leopoldino-Carolinae, vol. 10, pp. 105–110, 1 color pl.

ZWEIFEL, R. G.
1959. Additions to the herpetofauna of Nayarit, Mexico. Amer. Mus. Novitates, no. 1953, pp. 1–13.

ZWEIFEL, R. G., AND K. S. NORRIS
1955. Contribution to the herpetology of Sonora, Mexico: descriptions of new subspecies of snakes *(Micruroides euryxanthus* and *Lampropeltis getulus)* and miscellaneous collecting notes. Amer. Midland Nat., vol. 54, no. 1, pp. 230–249, figs. 1–3, 1 pl.